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ABSTRACT

This study extends previous research on labor market effects of vocational education by explicitly modeling the intervening factors in the relationship between secondary vocational education and labor market outcomes. The strategy is to propose and estimate a simplified, recursive model that can contribute to understanding why positive earnings effects have been so hard to find for men, why the effects vary between men and women, and why the effects differ according to the time unit of measurement. The data used are from the National Longitudinal Survey (NLS) of Labor Market Experiences, Youth Cohort, and the high school transcripts of a subsample of the NLS panel. The estimated model created shows that vocational education may have both direct and indirect effects on earnings, income, and unemployment, and that the indirect effects operate through such intervening factors as job-search methods, unionization, industry, occupation, job tenure, labor market experience, and postsecondary education. The findings regarding indirect effects have several implications for vocational education policy. Although indirect effects are not dramatic, they are not trivial, showing that vocational education can probably make a significant, but limited, contribution to improving productivity and reducing income inequality. Also, some changes in programs may be necessary since the findings show that vocational education differs substantially between whites and minority graduates in its capacity to foster longer job tenure, more labor market experience, and greater labor market stability. Several findings suggest that policymakers should not place a heavy emphasis on hourly earnings alone as an evaluative criterion for vocational education. Directions for future research also are suggested by the study. (KC)

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INFLUENCES OF HIGH SCHOOL CURRICULUM ON DETERMINANTS OF LABOR MARKET EXPERIENCES

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FOREWORD

The developing body of knowledge about the labor market effects of secondary vocational education has pointed to the necessity of considering carefully the intervening factors which influence and modify those effects. This study approaches that consideration by examining a simplified but reasonable model of the interrelations that have a potential for intermediating between these two phases of individual workers' lives.

Although the major focus of the report is upon earnings and employment as these relate to patterns of participation in secondary vocational education, it gives thoughtful and extensive consideration to the nature and operation of relevant intermediating factors. These are discussed in detail.

The combined data from the National Longitudinal Survey of Labor Market Experience, Youth Cohort (NLS Youth), and the high school transcripts of a subsample of the NLS panel were used for analysis. The availability of transcript data permitted the use of more precise and descriptive curriculum classification measures for the high school graduates for whom the comparisons were made.

The National Center is appreciative of the U.S. Department of Labor's research effort, the NLS Youth, being carried out by Michael Borus, Director of the Center for Human Resource Research, The Ohio State University. He was most cooperative in entering into the agreement under which the transcript data were merged with the interview data of the NLS Youth and from which this report was prepared. We wish to express our appreciation to him and to two of his staff members, Susan Carpenter and Michael Motto, who assisted in conducting the analyses for this report.

Additionally, the National Center extends its appreciation to the U.S. Department of Education, Office of Vocational and Adult Education, which funded the National Center's effort to collect the transcript data and to conduct extensive analysis of the effects of participation in vocational education.

This project was conducted in the Evaluation and Policy Division of the National Center under the direction of N. L. McCaslin, Associate Director. Many people made significant contributions in the course of its completion. We wish to thank the project staff, John Gardner, Project Director; Paul B. Campbell; Patricia Seitz; and Morgan Lewis, for their work in preparing this report.

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Robert Taylor
Executive Director
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in Vocational Education

EXECUTIVE SUMMARY

As national economic policy has placed increasing emphasis on microeconomic solutions to labor market problems, interest has grown in measuring the labor market effects of secondary vocational education. Recent efforts to measure those effects by applying rigorous statistical analysis to national survey data have found at least three results that seem to be consistent across the studies and to be puzzling to researchers and policy makers.

- First, the evidence is mixed as to whether male vocationally educated high school graduates (especially white males) earn significantly more per hour or per week than otherwise similar nonvocational graduates.
- Second, the effect of secondary vocational education on the hourly or weekly earnings of women in commercial or office specialties is more consistently and significantly positive than for men.
- Third, the longer is the period to which the earnings measure applies, the greater are any apparent advantages associated with secondary vocational training either for men or women.

This report extends previous research on labor market effects of vocational education by explicitly modeling the intervening factors in the relationship between secondary vocational education and labor market outcomes. The strategy is to propose and estimate a simplified, recursive model that can contribute to understanding why positive earnings effects have been so hard to find for men, why the effects vary between men and women, and why the effects differ according to the time unit of measurement. The estimated model shows that vocational education may have both direct and indirect effects on earnings, income, and unemployment, and that the indirect effects operate through such intervening factors as job search methods, unionization, industry, occupation, job tenure, labor market experience, and postsecondary education.

The data used to test the models are from the National Longitudinal Survey of Labor Market Experiences, the Youth Cohort (NLS Youth). The sample selected for analysis consisted of respondents who reported completing at least twelve years of education.

To investigate the intervening effects, the following questions were addressed:

- Can the relatively small total effects on the earnings of men be explained by a tendency for individually important indirect effects to offset each other?

- How much of an effect on earnings and unemployment does each of the intermediating factors have?

- What are the differences between men and women in the indirect effects that operate through each intervening factor?

- Are there differences between vocationally educated and other students in fringe benefits, working conditions, or other nonpecuniary characteristics of jobs?

- Can the differences between total effects on hourly earnings, weekly earnings, and annual income be explained best by longer hours worked, more weeks worked per year, multiple jobs, or some combination of these factors?

- How large are the direct and total effects of vocational education on earnings and unemployment?

- Which of the intervening factors are susceptible to changes in public policy, and what policy changes are suggested by the estimates found here?

A series of tables was used to examine the differences by pattern of participation in the intervening factors, starting with job search. These tables yielded the following conclusions regarding job search use and success:

Job Search Strategies and Patterns of Participation

- Concentrators make above average use of state employment services.

- Concentrators make above average use of advertisements.

Success Rates of Job Search Strategies

- Job search success through state employment services is inversely related to secondary vocational training.

- Concentrators are unusually successful users of newspaper advertisements.

Strategy Use and Educational Enrollment

- School employment services are primarily used by those enrolled, and rarely serve the job search process after graduation or school leaving.

Strategy Use by Race and Sex

- Black males and females are higher than average users of relatively unsuccessful state employment services.

Strategy Use and Reason for Search

- Those who have lost their jobs or are unemployed for other reasons tend to turn to the relatively unsuccessful state employment services.

Employment stability and regularity and types of jobs held were also examined using cross tabulations that yielded these conclusions:

Multiple Job Holding

- Concentrators are more likely than other pattern groups to hold multiple jobs for four or more months; Concentrator/Explorers, Explorers, and Incidental/Personal graduates are slightly more likely to report working in multiple jobs at least three months.

Number of Jobs

- For men who concentrated in vocational education there is a lesser tendency than other male graduates to have held four or more jobs. There is no clear trend in the number of jobs held for women.

Weeks in the Labor Force

- In general, persons with any level of concentration in secondary vocational education are more likely than Incidental/Personal and nonvocational youth to be in the labor force for a full year. Differences between the concentration groups are noted, however, within the male and female samples.

Weeks Worked and Weeks Unemployed

- Overall, males with any substantial investment in vocational education are more likely than other men to report working at least half of the year whereas among females the groups which exhibit similar tendencies are Concentrators and Limited Concentrators.

- Both males and females with a concentrator-type vocational background consistently report a higher likelihood of never being unemployed than the overall within-sex estimates.

Tenure

- For males and white females who have not been students for at least two years, higher vocational concentration is associated with one to two months longer job tenure.

Job Separations

- No clear relationship emerges for men or women between concentration in vocational education and the frequency of either voluntary or involuntary job separations.

Occupation

- Males with secondary vocational training are more likely than average to be in craft occupations.
- Females with secondary vocational training are more likely than average to be in clerical occupations.

Industry

- Male Concentrators, who are heavily represented in the agriculture specialty, are more likely to be employed in that industry.
- Male and female Limited Concentrators have above average representation in the construction industry.

Job Content

- Secondary vocational education is associated quite strongly with middle level job content.

Job Family

- Female Concentrators and Limited Concentrators move into the clerical job families in relatively higher proportions than other female graduates.
- There is a trend for males with substantial vocational concentration to be employed in the nonspecialized tool job family.

Job Class

- Male Concentrators are above average in self-employment.

Full-time/Part-time Jobs

- Male vocational Concentrators are significantly more likely than other graduates to work either thirty-five to sixty or more than sixty hours per week; females with a similar vocational experience are also more likely to hold full-time jobs and less likely to work part-time.

Unionization

- Male Concentrators are much less likely than other men to be in unionized jobs; female Concentrators are neither more nor less likely than other women to be unionized.

Size of Firm

- Though neither tendency is very strong, among men, vocational concentration is associated with less frequent employment in large firms, and among women the relationship is reversed.

Shift Employment

- For both men and women, higher concentration in vocational education is associated with more frequently working regular day (or evening) shifts rather than night, split, or varying shifts.

Fringe Benefits

- There is a weak tendency for respondents with some vocational concentration to be more likely to have paid health or life insurance or paid vacation.

Cross tabulations of earnings and income were examined, and a structural regression model that allows for indirect effects from vocational education was estimated. The cross tabulations were used to make comparisons of mean hourly earnings from the principal job the individual holds, of the median hourly earnings from the same job, and of reported total annual labor income from any or all jobs that the respondent holds. These three measures of income and earnings provided very different pictures of the effects of vocational education, especially for men.

Earnings and Income for Men

- In cross tabulations, male Concentrators exhibit disadvantages in mean but not median hourly earnings when compared to graduates who have no vocational credits.

- Advantages in annual income of between $1,000 and $2,000 per year are shown for male Concentrators in the full sample of respondents.

- That income advantage is partly due to postsecondary educational involvement of nonvocational graduates. This is apparent because the advantages over students with no vocational credits persist but are smaller when only respondents who have not recently been students are considered.

Earnings and Income for Women

- In cross tabulations the absence of differences across patterns of participation in hourly earnings among women are attributable to exceptionally high earnings of some nonvocational graduates who work less than full time weeks.

- When only women who usually work more than thirty-five hours per week are considered, Concentrators show mean earnings that are $.30 per hour above those women who have no vocational credits and median earnings advantages that are even greater.

- Both mean and median annual income for women show a consistent pattern of higher income with greater concentration. That relationship holds even among women who have worked at least thirty-nine weeks in the preceding year.

The regression estimates yielded the following conclusions about direct and indirect effects of participation in vocational education:

White Males

- Direct effects of concentration decrease hourly earnings of white males by about 10 percent for Concentrators who do not specialize in agriculture or T&I programs. For those specialists the reduction is only 4 percent. For Limited Concentrators and Concentrator/Explorers who specialize in T&I, earnings are increased by between 4 and 6 percent.

- The largest indirect effect for white men decreases earnings by up to 4 percent because it reduces the likelihood of being in a unionized job.

Minority Males

- Direct effects decrease earnings substantially for minority male Limited Concentrators and Concentrator/Explorers.

- For minority males, indirect effects through union tend to reduce earnings; those through education, transportation, construction, and manufacturing increase earnings.

White Females

- White female Concentrators have substantial earnings advantages over other women.

- Indirect effects through tenure, experience, transportation, trade, finance, and unionization increases the earnings advantage for white female Concentrators.

Minority Females

- Minority women's earnings are increased by indirect effects through tenure, experience, transportation, trade, finance, public administration, and unionization.

- The largest impact for minority women is a direct effect of 11 percent for office specialization on earnings.

The results from the tables and the regression analysis suggest the following answers for the questions raised by the three consistent by puzzling results noted here:

- Differences in median earnings suggest even greater similarity between vocational and nonvocational students than one would infer from mean earnings data. The failure to find positive direct or total effects for men on hourly earnings is not the result of vocational education being irrelevant to labor market outcomes. It occurs primarily because of negative direct effects on earnings and because of four indirect conflicting tendencies that offset each other.

- Differences in the apparent effects of vocational education for men and women are attributable to basic differences in the labor markets in which members of each sex usually find work. Vocational education apparently is more successful for women than for men in directing its students into industries and occupations that are well paid (compared to other jobs traditionally held by women). Also, being in a unionized job creates a smaller differential for women than it does for men, and there is no tendency for women vocational graduates to be less likely to be in unionized jobs.

- Relative advantages in annual earnings for vocational graduates are attributable to longer average hours worked and to a higher average number of weeks worked per year.

The findings regarding indirect effects have several implications for vocational education policy. Indirect effects on earnings of vocational education, although not negligible, are also not dramatic. No single indirect effect in figure 4-1 accounts for more than about a 5 percent difference in earnings. But in circumstances in which total differentials are at most 10 to 15 percent, even a source of a 1 percent differential is not trivial. Vocational education at the secondary level can, therefore, probably make a significant, but limited, contribution to improving productivity and reducing income inequality. Also, Administrators and instructors must remain flexible in designing new programs or suggesting changes in existing programs. Some changes in secondary vocational education may be called for in light of the finding here that vocational education differs substantially between whites and minority graduates in its capacity to foster longer job tenure, more labor market experience, and greater labor market stability. Several separate findings in this study suggest that policymakers and adminstrators should not place a heavy emphasis on hourly earnings alone as an evaluative criterion for vocational education. Administrators and policymakers in vocational education must recognize that compensating differentials in earnings may be important, for there are ample indications from this study that the presence of compensating differentials may cause hourly earnings to understate the benefits that accrue to vocational graduates.

The findings in this study also suggest directions for future research. Future efforts should allow for a greater degree of simultaneity among the dependent variables used in the regression model. More controls should be added to the model to improve the correction for any bias attributable to nonrandom selection into the various patterns of participation in vocational education. Research is needed into methods for assessing and reflecting adequately in analysis the quality and

availability of a school's vocational education programs. The specification in this report of postsecondary experiences can be improved upon by constructing a model that estimates the effects of participation in vocational education on types of postsecondary education. Finally, the consideration that prompted the suggestion that nonpecuniary aspects of jobs could be important for assessing the effect of vocational education does suggest the need for a close examination of the job satisfaction of vocational graduates.

CHAPTER ONE

FRAMEWORK FOR ANALYSIS

Introduction

As national economic policy has placed increasing emphasis on microeconomic solutions to labor market problems, interest has grown in measuring the labor market effects of secondary vocational education.* Recent efforts to measure those effects by applying rigorous statistical analysis to national survey data have found at least three results that seem to be consistent across the studies and to be puzzling to researchers and policy makers.

- First, the evidence is mixed as to whether male vocationally educated high school graduates (especially white males) earn significantly more per hour or per week than otherwise similar nonvocational graduates.
- Second, the effect of secondary vocational education on the hourly or weekly earnings of women in commercial or office specialties is more consistently and significantly positive than for men.
- Third, the longer is the period to which the earnings measure applies, the greater are any apparent advantages associated with secondary vocational training either for men or women.

This report extends previous research on labor market effects of vocational education by explicitly modeling the intervening factors in the relationship between secondary vocational education and labor market outcomes. The strategy is to propose and estimate a simplified, recursive model that can contribute to understanding why positive earnings effects have been so hard to find for men, why the effects vary between men and women, and why the effects differ according to the time unit of measurement.**

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*See Mertens et al. (1980) for a summary of studies reported between 1968 and 1979 that attempted to measure such effects. See Woods and Haney (1981) for a summary that includes studies from 1980 and early 1981.

**The obvious arithmetic answer to the third question is that if former vocational students do not earn more per hour they must either work longer hours per week or more weeks per year. The investigation here is searching for more informative explanations.

The estimated model shows that vocational education may have both direct and indirect effects on earnings, income, and unemployment, and that the indirect effects operate through such intervening factors as unionization, industry, occupation, job tenure, labor market experience, and postsecondary education.

The data used to test the models are from the National Longitudinal Survey of Labor Market Experiences. the Youth Cohort (NLS Youth). The sample selected for analysis consisted of respondents who reported completing at least twelve years of education. This strategy allowed this project to avoid dealing with the problem posed by dropouts from high school.* Several methods were used to control for effects of schooling beyond twelve years and for variations between students and other respondents in the intensity of their attachment to the labor market.

The balance of this chapter consists first of a discussion of the framework used for the analysis. This framework provides the reader with the background information and the basic assumptions that guided the analyses. The specific research questions investigated are then described and explained. A brief description of the NLS Youth data base follows this section. The chapter concludes with a discussion of the method by which participation in vocational education is measured in this report.

A Model for Effects of Secondary Vocational Education

To understand the contribution that secondary vocational education is expected to make to labor market participation, it is necessary to take into account the complex network of interactions through which the contribution has to occur.

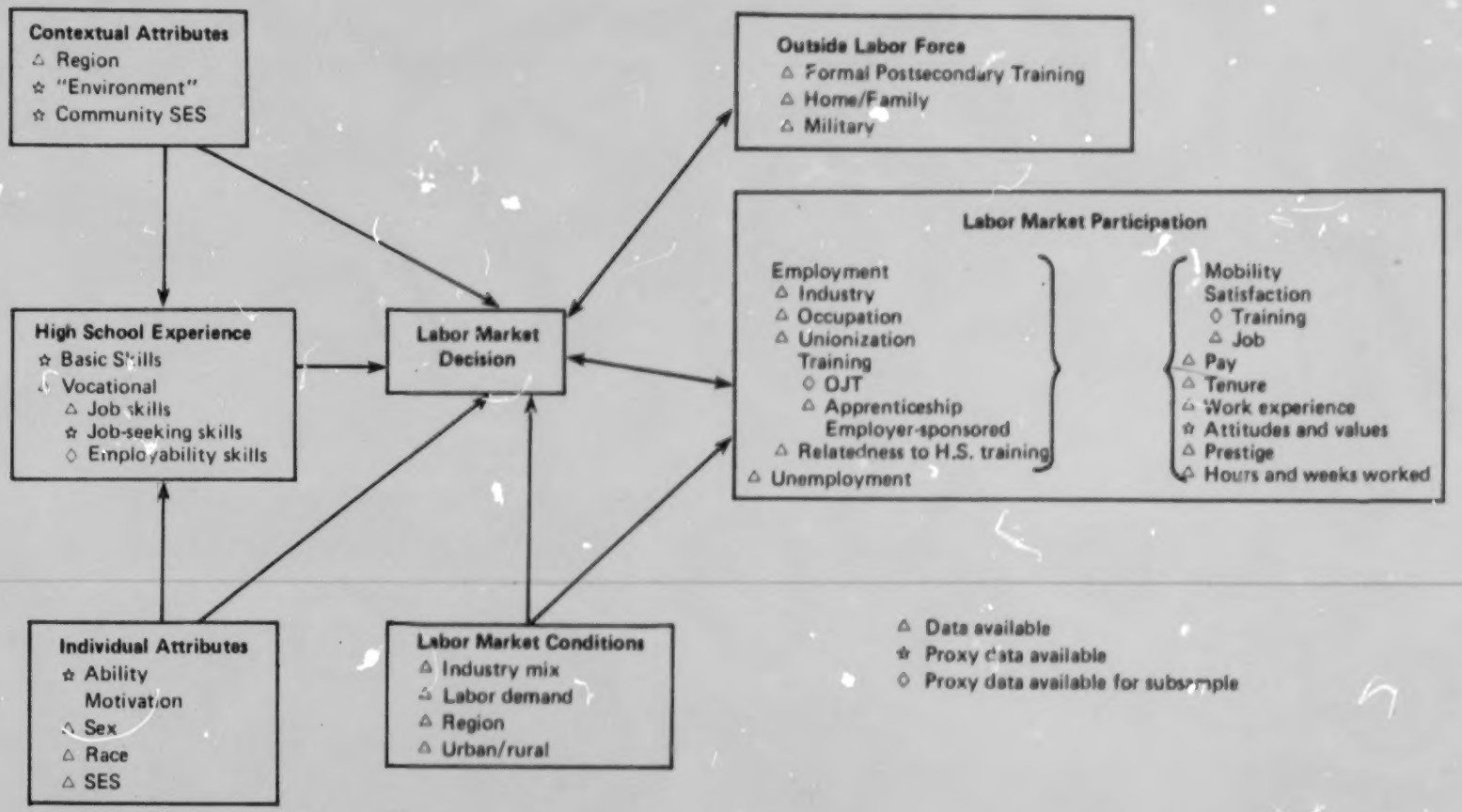
A schematic representation of one model of this network is presented in figure 1-1. Three categories of elements are presented in the diagram. They are influences, experiences, and decision points. Although there is not an inviolate temporal or causal ordering in the process, a reasonable place to begin consideration of the network is at the point of high school experience. It is at this point that two sets of influences come to focus that may alter the vocational education experience sufficiently to be transmitted to the labor market decision point, and thence to the labor market.

---

*Another study in progress at the National Center concentrates on the dropout issue (Mertens, Seitz, and Cox 1982).

FIGURE 1-1

VARIABLES INFLUENCING LABOR MARKET BEHAVIOR



The high school experience itself includes both training and informal learning in academic skills, basic skills, and vocational skills. The nature of the high school experience is influenced by two primary sources: the attributes that the individual brings to the experience and the contextual attributes of the school itself. These two sources of influence also impinge directly and independently upon the labor market decision point, thereby contributing to decision variability regardless of the quality of the high school experience.

Among the individual attributes that are expected to influence the high school and labor market experiences are ability, motivation, sex, race, and individual and family socioeconomic status (SES). Some of these attributes are judged to be potentially modifiable by experience, others are not. The contextual variables include region of the country, community socioeconomic status, and other local environmental conditions. Because only the local environmental conditions may be amenable to alteration, they become of primary interest. Geographic region and community SES may help explain high school and labor market experience but cannot be reasonably or practically manipulated to change either. Identification and measurement of the local conditions, such as community attitude toward the work ethic and individual responsibility are, however, extremely difficult and complex. Consequently, in most analyses a substantial proportion of these attributes remain unexplained in the residuals.

The central axis in the vocational education/career network is the labor market decision point. In addition to being influenced by individual attributes and other contextual attributes, the characteristics of the labor market itself may also exert a major influence upon the decision. Likewise the requirements or availability of postsecondary education, home and family activities, military training, and other nonlabor market activities will influence the decision. When the decision to enter the labor market is made, the two possible results are employment and unemployment. Which of these two alternatives occurs is also heavily influenced by the high school experience, the effects of individual and contextual attributes through this experience, and the effects of these latter two attributes directly.

The labor market conditions that influence the decision also influence directly the employment/unemployment results of the decision. If the result is continued unemployment, initial decisions are likely to be periodically reevaluated, with possible nonlabor market outcomes. If, on the other hand, employment results, there are characteristics of employment that may be influenced by the high school vocational education experience--characteristics that must be accounted for before there can be an adequate explanation of the relationships. These characteristics themselves tend to be interdependent and overlapping. Assessing them is therefore difficult. Nevertheless they cannot be

ignored. They include the nature of the industry, the nature of the occupation, the presence of unionization, the availability of training, and the relatedness of the employment to the high school training experience. Finally, there are a series of attributes of the job or career that may be influenced by secondary vocational education, but may only be evaluated through employment. These include mobility, satisfaction with training and job, pay, tenure, work experience, attitudes and values, prestige, and time worked.

Figure 1-1 also shows the state of data availability for the NLS sample, classified by its degree of directness. The analyses undertaken in this study are therefore constrained to deal with only part of the network because data are not available for all of the potentially relevant variables.

Research Approach

The approach followed here is similar to that suggested by Gustman (1982)* at a conference on youth employment problems. He called, among other things, for study of the role of vocational education in the job search process, in the determination of tenure on the job and general labor market experiences, and in development of productive skills through on-the-job training, with a special emphasis on the ". . . intermediating role of tenure, experience, unionization, and other intervening variables which may be affected by vocational training. . . ."

The decision in the present study to focus on intermediating influences developed from discussions of why the effects--particularly for earnings--that educators, researchers, and policymakers expect vocational education to have seem to be so difficult to detect in survey data. As those discussions progressed it became clear that the exact relationship between labor market experiences, secondary vocational education, and intermediating influences is not thoroughly understood, and that no comprehensive theory of the relationship has gained widespread acceptance. Even for isolated aspects of the relationship there are very few widely accepted theories. Of particular concern for this project is the fact that the manner in which vocational education is expected to affect earnings and employment had never been systematically and thoroughly set out. An attempt to sketch the relationships by building on the very general model just outlined was made in Mertens and Gardner (1981, chapter 3). The

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*Strictly speaking, to the authors' interpretation of Gustman's remarks. His suggestions were deeply appreciated by the authcrs. But, he bears no responsibility for their errors in translating his suggestions into a finished product.

remainder of this chapter draws freely on that discussion in order to make explicit the conceptual framework that guided the analyses in this report.

The principal implications of the framework follow, first, from the distinction between direct, indirect, and total (net) effects, and second, from the interrelationships among criterion measures of effectiveness. Consider these two sources of implications in turn.

The indirect effects are those that operate through the intermediating influences that Gustman points out and that are indicated in figure 1-1; direct effects involve no such intermediating influences. Total effects are, of course, simply the sum of direct and indirect effects. The studies that form the basis for the findings stated at the beginning of this chapter estimated total effects, although the absence of a development of explicit models in those studies has obscured that fact. The importance of the distinction among types of effects is that failure to find a significant total effect for vocational education on any particular criterion measure does not imply that vocational education has no effects at all, even on that criterion. It implies only that the sum of the direct and indirect effects, which may operate through many different routes, is near zero. That finding would be important and useful if it could be shown that positive effects from some sources are being offset by negative effects from other sources that either are subject to influence by policy or are reflections of voluntary choice. In one case, the results would suggest directions for policy. In the other case, there would be a strong presumption that the voluntary choices that may appear to worsen some labor market outcomes must yield compensating benefits in another dimension, and the presumption would suggest directions for further research.

For example, suppose a researcher were to find that participation in either apprenticeship or employer-sponsored training programs increased individual earnings. Vocational education could have indirect effects on earnings if it influenced the likelihood that a former student would participate in such programs. But if participation in vocational education increased the likelihood of participation in one program while it decreased the likelihood of participation in the other, the total (or net) effect on earnings might be very small when averaged across all students. Moreover, if the reduced likelihood of participation in one program could be traced, for example, to faulty communications between vocational educators and the institutions that manage that other program, the policy recommendation for improved linkage would flow immediately from that finding.

The interrelatedness of criterion measures is significant because a failure to find the effect that one expected on a particular criterion does not necessarily imply that no effect

exists. The finding may instead indicate that the effect is being manifested through other criteria. If vocational education does not seem to affect hourly earnings, for example, that may be because former vocational students are more willing than others to trade off higher hourly earnings for more stable employment or better working conditions.

To understand the approach taken in this report, a brief discussion is required of both these intermediating influences and the possibilities for trade-off on criterion measures of outcomes.

Intermediating Factors and Trade-offs

The possibilities for trade-off exist because any individual employee's job situation can be described by a bundle of characteristics that relate to both the job (no matter who holds it) and the employee (in this particular job). The characteristics include the industry, occupation, pay, stability of employment (hours worked per week and weeks worked per year), prestige and degree of unionization of the job, fringe benefits, working conditions (riskiness, shift worked, locale), the relatedness of the job to the employee's training, the employee's tenure on the job, and the length and stability of the employee's labor market experience.

For any individual worker at any specific time, these characteristics are tightly interrelated. Some close relationships among these characteristics are inherent in the job. For other characteristics, the exact relationship for any individual depends on how personal preferences lead that person to choose among occupations. A unionized job in manufacturing, for example, is more likely to be a lower prestige operative job than a higher prestige professional job. As one considers different jobs, the characteristics can to some extent be traded off against each other. Hence, one can "explain" much of the difference in pay between two jobs by knowing whether the jobs are unionized, which industry they are in, and the cyclical sensitivity or seasonality of employment. One can "explain" much of the difference in earnings between two individuals in similar jobs if one knows the employees' tenure and the length and stability of their overall work experience.

Which of these job characteristics or other factors are considered to be "outcomes" or "criteria" and which are considered to be "intervening mechanisms" depend on the emphasis of the analysis. For psychological or sociological studies, job satisfaction is most likely to be considered an "outcome." An economic analysis of the effects of vocational education would most

likely categorize both job satisfaction and postsecondary educational attainment as "intervening mechanisms" that help to explain employment stability and earnings.

Hourly earnings on the most recent job, annual income, and weeks unemployed are regarded here as outcomes, and most other aspects of work history, educational attainment, and job characteristics are seen as intervening mechanisms in the determination of those outcomes. The relationship between the intermediating factors and the outcomes is determined by how vocational education is expected to influence productivity and job selection.

Economic theory suggests that employees' earnings should be closely related to their individual net (marginal) productivities. Vocational education may increase net productivity if it aids students in acquiring occupation-specific (but usually not firm-specific) skills; in acquiring basic, communication, and leadership skills and good work habits; in improving learning capacity, and in reducing subsequent training costs. If vocational education imparts these skills better than a general curriculum, and if employers perceive that difference, employment prospects and initial pay levels should be better for vocationally educated youth than for youth who are otherwise alike but who followed a general curriculum. To the extent that learning capacity is fostered or training costs are reduced, earnings growth on the job should also be higher.

Educational courses can perform a credentialing or signaling function that enables employers either to pay different earnings for entry-level jobs or to identify better risks among job applicants. The signaling function may reduce the employer's risk and cost in obtaining this information and allow the firm to hire more readily, or to pay higher wages to, new vocationally-trained employees who are better risks. The validation of the employer's expectations occurs as the employee acquires tenure with the firm and as the employer evaluates the worker's current and potential productivity. Hence, earnings can rise with tenure either because productivity grows as new skills (firm specific and/or job

specific) are acquired or because the employer's perceived risk regarding the employee's productivity is reduced.*

The shape of the entire life cycle earnings profile depends on the intermediating influences that one expects to operate here, and those influences are conditioned by the way in which vocational education affects productivity. Any earnings differential between students from different curricula that exists at some point in the life cycle can change over time as high school training becomes more distant and direct job experience becomes more important in determining current productivity. As Gustman and Steinmeier (1981) pointed out, if vocational education directly replaces early on-the-job training and if (as in most career progressions) there are limits to the proficiency that can be attained, one would expect former vocational students to have an early earnings advantage over former general curriculum students in the same occupation, an advantage that narrows with time and eventually disappears.

Meyer (1981) pointed out that a different pattern of life cycle variation would accompany a different mechanism for transmitting the effects of vocational education. Vocational and general students might systematically find employment in different types of jobs with different earnings profiles. In this scenario vocational students tend to work in jobs that have both high initial earnings and flat earnings profiles, whereas general students tend to find jobs with steeper earnings profiles but lower initial earnings. In this case the former vocational graduates would start out with an earnings advantage over general students that would eventually disappear. This case differs from Gustman and Steinmeier because the initial advantage may eventually be reversed.

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*If vocational education performs this credentialing function, the supply of vocationally educated labor may increase relative to generally educated labor in ways that reduce any favorable earnings differentials, lengthen search duration, and raise unemployment rates for individual vocational students. This point was argued persuasively by Gustman and Steinmeier (1980). They also noted that the extent of supply-side effects depends on the availability of facilities and instructors and the ease of entry into vocational programs. Neither the data available to Gustman and Steinmeier (NLS-LME and Class of '72) nor the NLS Youth data permitted accurate estimates of these supply-side adjustments. This is clearly a subject that deserves closer examination. The emphasis here is on the intermediate effects of vocational education that link the proximate effects to labor market outcomes. It is the outcomes rather than the intermediate effects that are masked by the supply-side adjustments that Gustman and Steinmeier discussed.

Meyer's scenario implies that general students obtain jobs that provide more on-the-job training than do the jobs that vocational graduates obtain. Normal career progression involves acquiring new skills, improving old ones, and demonstrating competence, all of which improve the individual's earning capacity within a firm. This permits the firm to increase pay with tenure. Second, if the improved capacity is not reflected in advancement within a firm, employees are likely to find another firm that will compensate them more appropriately. The improved earning capacity need not always be reflected in higher earnings, for the employee may use it instead to "buy" improvements in hours, prestige, working conditions, and/or job duties. However, it will be reflected in a more satisfactory overall employment situation, and it should be reflected in greater job satisfaction* for the employee.

Vocational education may further affect earnings and employment by influencing the efficiency of a person's job search and application process. It can help students to assess their own abilities and interests better, thereby narrowing the focus of the job search. Students may also learn where and how to find job openings, or they may even be directed by teachers or counselors toward specific job vacancies. These factors can contribute to a more efficient job search, thereby reducing the expected duration of a spell of unemployment and helping students find better-paying jobs.

Workers are concerned about job characteristics and outcomes such as pay, prestige, security, hours, working conditions, regularity of employment, advancement opportunities, and the appeal of the work, to list only a few. In two ways vocational education may guide the student toward jobs that have particular sets of characteristics.

First, vocational education tends to confer skills that are appropriate to particular occupations. Second, participation in vocational education is likely to reflect the interests of a student in particular kinds of work, either because the student takes courses that develop preexisting interests or because the courses create new interests. Rumberger and Daymont (1982) provide some evidence suggesting that this may be the case. Since job characteristics vary systematically across occupations, one would expect the distribution of the characteristics of jobs held by vocational and general students to vary systematically if vocational education influences the types of jobs that people have.

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*Job satisfaction is the subject of another study in progress at the National Center (Campbell et al. forthcoming).

Institutional constraints and the structure of labor markets can limit the applicability of the traditional assumption that individual employees are paid according to their own productivity as determined in competitive markets. As those constraints limit the usefulness of earnings as a criterion of training effectiveness, however, they create possibilities for trade-offs among various criteria. Existence of internal labor markets and of limited ports of entry or exit, long-term contracts, the idiosyncrasies of firms, the bureaucratization of the hiring and wage-setting processes, and the role of production teams in modern enterprises combine to limit the range of competition for wages.* Minimum wage laws also may inhibit payment of wages that correspond to individual productivity. In both of these cases, however, employers will adjust other aspects of the employment situation. If vocationally educated youth are more productive than nonvocationally educated youth, differences will emerge in these other aspects of labor market outcomes. If vocational graduates are known to be more productive in certain classes of jobs, for example, they will be hired more quickly than will general curriculum students in situations where either type of student would receive the same wage when hired.

Thus, institutional structure should not negate any positive effect of vocational education on productivity, but it may shift the manifestation of that effect from earnings to other outcomes.

This discussion can be summarized in terms of the outcomes (criteria) that are examined in this report and the intermediating factors that help to explain the effect of vocational education on those outcomes. The focus here is on hourly earnings, annual income, and weeks in the labor force and weeks unemployed as outcomes. Vocational education is expected to affect those outcomes through its impact on a respondent's approach to job search, educational attainment, labor market experience, job tenure, occupational choice, industry of employment, unionization, fringe benefits, job safety, and frequency of various types of job separations. Some of these intervening relationships have been examined before, but never in a unified treatment that has linked vocational education to them and then linked them to outcomes, and never before with a recently developed** classification scheme to identify different patterns of participation in vocational education.

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*See for example, Doeringer and Piore (1971), Williamson, Wachter and Harris (1975), Thurow (1975), and Okun (1981).

**This scheme is discussed further below. For a detailed presentation see Campbell, Orth, and Seitz (1981).

Research Questions

The three findings cited earlier regarding the labor market effects of vocational education explain the concern in this report to focus on indirect routes of effects. The research questions that are considered in this report grow directly from the anomalies that are apparent in a more detailed consideration of these findings.

First, the evidence is mixed as to whether male vocationally educated high school graduates (especially white males) earn significantly more per hour or per week than otherwise similar non-vocational graduates.* Grasso and Shea (1979) report this result in an analysis of data from the National Longitudinal Survey of Labor Market Experience (NLS-LME) data. Black male vocational graduates even appear likely in those data to earn less than other black males, though the difference is not statistically significant. Similar results using the same data were reported by Gustman and Steinmeier (1981) and Mertens and Gardner (1981). Meyer's (1981) analysis of data from the National Longitudinal Study of the High School Class of 1972 (Class of '72) survey found only small earnings effects for vocational education for men. They are statistically significant only for specialists

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*The findings of previous research are summarized here somewhat differently than they are by Woods and Haney (1981). Their review suggests, although they do not explicitly acknowledge this in their discussion, that regression analyses show significant advantages for male vocational graduates less frequently, and significant earnings advantages for women more frequently, than do simple descriptive comparisons of average earnings. Since regression analyses, if properly done, should provide better estimates of any effects of vocational education, the current authors are inclined to attach more weight to those results and less to the descriptive studies than do Woods and Haney. This difference in emphasis explains the conclusions here that the differences between men and women in estimated effects of vocational education are somewhat sharper than are protrayed by Woods and Haney.

Moreover, Woods and Haney point out that stronger evidence of positive earnings effects is found for men when participation in vocational education is identified by self-report than when it is identified by coursework. Their own reanalyses of the Class of '72 data support that difference. It is argued elsewhere by two of the present authors that accurate specification of coursework from transcript data more appropriately identifies curriculum (Campbell, Orth, and Seitz 1981). Attaching greater weight to regression analyses based on coursework again leads to a sharper contrast between estimated effects for men and women than Woods and Haney offer.

in the trade and industry area, and for them, only in one year (1973) during the period of estimation (1973 - 1979). Gustman and Steinmeier and Mertens and Gardner found similar effects in their analyses of those same data. For hourly earnings Mertens and Gardner reported disadvantages for male business specialists, advantages for marketing (distributive education) specialists, and mixed results for trade and industry specialists. Reanalyses of Class of '72 data by Woods and Haney usually showed white male vocational graduates earning less than comparable general curriculum graduates, though the estimates were seldom significant. They did report a more consistently significant positive pattern of effects for black men who specialize in trade and industry. In a study using an especially designed survey of younger adult workers, Mertens and Gardner found earnings advantages that were statistically significant only for a small group of specialists in marketing (distributive education).

In studies of the NLS Youth neither Rumberger and Daymont (1982) nor Campbell et al. (1981) could find convincing evidence of consistent and significant positive earnings effects among men with twelve or fewer years of education. Rumberger and Daymont found that additional vocational credits were associated with higher hourly earnings if the credit was earned in a program that had provided skills that were being used on the respondent's job. Additional credits in vocational courses that were not related to the job reduced hourly earnings. However, whether the vocational coursework was expressed as total credits or as a proportion of total courses taken, the estimated effects of job-related courses were not significantly different from zero. Campbell et al. found that a pattern of greater concentration in vocational education was associated with slightly (not statistically significant) lower earnings per week for men.

Second, the effect of secondary vocational education on the hourly or weekly earnings of women in commercial or office specialties is more consistently and significantly positive than for men. Grasso and Shea found statistically significant, positive earnings effects for women who had training in commercial or business/office courses. In the Class of '72 and NLS-LME data sets, Meyer, Gustman and Steinmeier, and Mertens and Gardner similarly found significantly higher earnings (hourly and weekly) for women who took vocational courses in the business/office area. Reanalyses by Woods and Haney of Class of '72 data show strongly positive effects for white women, somewhat less significant (but always positive) for black women. Campbell et al. found strongly significant earnings advantages for women (especially minority women), and Rumberger and Daymont reported similar findings for the NLS Youth. The only apparent sources of disadvantage in earnings for women were so unimportant as to

barely merit mentioning: specialization in home economics* (found in Meyer's study) or vocational courses not used on the current job (in Rumberger and Daymont).

Third, the longer the period to which the earnings measure applies, the greater are any apparent advantages associated with secondary vocational training either for men or women. Although advantages in weekly or hourly earnings for male vocational graduates are very difficult to detect, both Conroy (1979) and Li (1981) reported advantages in annual labor income for men. Gustman and Steinmeier also found a statistically significant advantage in male annual labor income, but only for specialists in the trade and industry area. Meyer found that any advantages for women in hourly earnings were magnified in weekly earnings and annual labor income by the longer hours per week and the more weeks per year that women vocational graduates worked. Rumberger and Daymont did not estimate equations for weekly or annual earnings. Their findings, however, of significantly longer hours worked (for both men and women) and (usually)** fewer weeks per year unemployed suggest that they would have found results for weekly and annual earnings in the same direction as those of Meyer and Gustman and Steinmeier.

The model presented earlier suggests that the failure to find consistent effects for men on short-term measures of earnings, the differences in apparent effects for men and women, and the sensitivity of estimated effects to the time unit of measurement may all be explained in large part by an improved understanding of the factors that mediate the effect of vocational education on labor market outcomes. To investigate those intervening effects, the authors of the present study sought to answer the following questions:

- Can the relatively small total effects on the earnings of men be explained by a tendency for individually important indirect effects to offset each other?

- How much of an effect on earnings and unemployment does each of the intermediating factors have?

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*Includes both occupational and nonoccupational home economics courses.

**They found that more vocational credits reduce unemployment. But a higher proportion of vocational credits reduce unemployment for women by only a small amount and actually increase it for men.

- What are the differences between men and women in the indirect effects that operate through each intervening factor?

- Are there differences between vocationally educated and other students in fringe benefits, working conditions, or other nonpecuniary characteristics of jobs?

- Can the differences between total effects on hourly earnings, weekly earnings, and annual income be explained best by longer hours worked, more weeks worked per year, multiple jobs, or some combination of these factors?

- How large are the direct and total effects of vocational education on earnings and unemployment?

- Which of the intervening factors are susceptible to changes in public policy, and what policy changes are suggested by the estimates found here?

Description of the NLS Youth Data

The data used in this study are from the National Longitudinal Survey of Labor Market Experience, the Youth Cohort (NLS Youth). Both interview and transcript data are used in the analyses. The Center for Human Resource Research (CHRR) at the Ohio State University, with support from the U.S. Departments of Labor and Defense, initiated the NLS Youth interview data collection in 1979. The National Center for Research in Vocational Education, with funding from the U.S. Department of Education, Office of Vocational and Adult Education, and under a collaborative agreement with CHRR, supplemented the NLS Youth interview data with the high school transcripts of the older members of the cohort. The merger of the two data sources provides a cost-effective and the best available information base to examine the effects of secondary vocational education on labor market experiences.

The NLS Youth is a national probability sample of 12,686 persons who were between the ages of fourteen and twenty-one when originally selected for the survey in 1978. The sample was drawn by a household screening process in three stages: a cross-sectional sample; a supplemental sample of blacks, Hispanics, and economically disadvantaged whites; and a sample of youth serving in the military. Both the cross-sectional and supplemental samples were stratified by sex in order to obtain relatively equal proportions of men and women. The military sample includes an oversampling of women and is roughly composed of one-third women

and two-thirds men. Weighting procedures have been developed to compensate for the oversampling of these groups.*

NLS Youth respondents were first interviewed early in 1979. The data collected in the base year included background information about the respondent's family, schooling, and work history. In addition, data on current educational and labor market activities were obtained. Follow-up interviews with NLS respondents have been conducted in 1980, 1981, and 1982. (Data from the 1982 interviews are not yet available.) Key questions relating to labor market and educational experiences and demographic changes (e.g., marital status) were replicated to provide continuity across the survey years. Annual interviews with the participants in the NLS Youth survey are presently scheduled through 1984.

The transcript collection effort was initiated in 1980 when the high school records for persons seventeen years of age and older were obtained. Transcripts for NLS Youth respondents who were fifteen and sixteen at the time of the first interview were added to the data files in 1981. The information gathered from the transcripts included the grade level at which a course was taken, a course code, the amount of credit received, and the letter grade received for the course. These data were then used to identify the patterns of vocational participation in high school in order to make a better examination of the effects of vocational training on the labor market experiences of youth.

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*For a full description of the sampling design, weighting procedures, and a descriptive analysis of the first year's data, see Borus et al., Youth Knowledge Development Report 2.7 Findings of the National Longitudinal Survey of Young Americans, 1979 (1980).

Weights are used in the cross tabulations but not in the regression analyses undertaken in the present report. Where sample sizes permit, analyses are done separately for men and women and for whites, blacks, and Hispanics. In most cases the sample sizes required that blacks and Hispanics be grouped together and called "minority." This treatment combines racial and ethnic characteristics in a way that is not ideal. But social research has used this combination of characteristics frequently, and the results here suggest that, in most respects, blacks and Hispanics are more like each other (in their labor market behavior) than either group is like whites.

Patterns of Participation

As previously noted, transcript data were used by Campbell, Orth, and Seitz (1981) to classify persons into different patterns of participation in vocational education. This method is preferred over both self-report of high school curriculum and administrator classification because it reflects the variability within the vocational education experience. In most previous studies, all students who reported that they had followed a vocational program or who were classified as vocational by school administrators were treated as a homogeneous group. Some studies have allowed for variations in specialty area or for the difference between courses related or not related to later jobs. For this report, the amount and variation of a student's actual vocational credits, as indicated on the transcript, were used as indices of involvement in secondary vocational education.*

The patterns of participation were first developed by operationalizing five descriptive concepts that reflect different aspects of vocational course-taking. Briefly, the descriptive concepts include (1) the number of credits received in vocational courses in the program area of specialization; (2) the number of program areas in which vocational courses were taken; (3) the number of years in which the specialty was pursued; (4) the number of vocational credits in the program area that were determined to be supportive of the specialty area; and (5) a scaled measure of whether the specialty was pursued in the eleventh and/or twelfth grade. A student's area of specialization was defined as the program area (e.g., distributive education, home economics) in which at least six-tenths of the total number of vocational credits were received.

These descriptive concepts were used to construct target profiles. The target profiles represented the set of scores hypothesized as most likely to be associated with each pattern type. The transcript record was used to obtain a profile of scores for the descriptive concepts for each student. The actual case profiles were then compared to the target profiles, and

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*Seven subject matter areas were identified on students' transcripts as "vocational." These categories were agriculture, marketing and distributive education, health occupations, home economics, office occupations, technical education, and trade and industrial occupations. Technical education was combined with trade and industrial courses, and the two are identified here as a single specialty area. A concerted effort was made to exclude from the vocational classifications such course areas as industrial arts, personal typing, and nonoccupational home economics.

assignment to a pattern was based on the Euclidean distance function.* A case was assigned to the pattern type from which it had the least distance. The five patterns were labeled Concentrator, Limited Concentrator, Concentrator/Explorer, Explorer, and Incidental/Personal, and were ordered by the degree of involvement in vocational education.

Concentrators take an average of six vocational credits over a three-year period. Limited Concentrators generally take about half the number of vocational credits as Concentrators, usually within a two-year span. The next pattern group, Concentrator/Explorer, is similar to the Limited Concentrator pattern except that the vocational course work is usually completed early in the high school years. Students classified in the Explorer pattern pursue courses in three or more program areas but do not achieve any level of specialization. In comparison, Incidental/Personal students average less than a full credit and generally complete the work in a semester.

These patterns were used in the analyses in place of the traditional curriculum descriptors of vocational, general, and college preparatory. Also, in order to evaluate how representative the subsample of respondents with transcripts was, persons who had completed at least twelve years of school but for whom transcript data were either missing or incomplete were included in the analyses. This group was labeled "Incomplete Transcript."

Organization of the Report

The balance of this report is organized as follows. Chapter two explores the possible relationships between secondary vocational education and job search activities. A series of cross-tabulations, with chi-square tests of significance, were used for these analysis. Cross-tabulations were also conducted to examine the relative association between vocational training and various measures of labor market experience--hours worked per week, unionization, type of job, weeks unemployed, and others. These results are presented in chapter three. Chapter four presents

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*For a full description of the methodology and techniques used to construct and validate the patterns of participation variable, the reader is referred to the work by Campbell, Orth, and Seitz (1981).

the estimates from a series of regression equations which ultimately focus on earnings. Conclusions and policy implications are discussed in chapter five.*

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*Readers who prefer a descriptive and less technical approach to these issues will find chapters two and three more to their liking and may prefer merely to skim chapter four. However, the absence of controls for such influences as socioeconomic origins or level of education should caution against the interpretation of differences in tables as estimates of effects of vocational education. Chapter four presents a more technical approach to modeling some of these labor market outcomes while controlling for multiple influences. But not all the elements that are described in chapters two and three are modeled in chapter four. For example, no formal modeling was attempted of the job search process, the distribution of fringe benefits, or the incidence of multiple job holding. In some instances this is attributable to time and resource constraints of this project; in other instances to a judgment that little additional information would be gleaned from formal models.

CHAPTER TWO

JOB SEARCH METHODS

The Function of Job Search Methods

As illustrated in the preceding discussion, the transition from school to employment may be influenced by many factors. A significant facet of the matching process between an individual's skills and available jobs may be the pattern of job searching that the individual follows. Job search methods are either direct--contacting the employer at the place of business or responding to an advertisement placed by the employer, or through some form of brokerage--employment services or friends and relatives. Depending upon the type of job being sought, there is some evidence that direct employer contact and job information secured through family and friends have in the past been found to be the most productive strategies (Parnes 1954; Rees and Shultz 1970; Egan 1976; Becker 1977).

An analysis of the 1981 interview data from the NLS Youth results in findings that are generally consistent with this conclusion, although some notable changes are evident. Direct employer contact and family and friends are still the most successful strategies, but they are very closely followed by private employment agencies and newspaper advertisements as successful sources of information about jobs. (These findings are discussed in more detail at a later point in this section.)

Assuming that this accumulated evidence in fact reflects the reality of the job search situation for the large proportion of individuals, it becomes important to know what approach vocational graduates take in their job search, and whether they choose those methods most likely to be successful. At the same time, it is necessary to recognize that many other factors may influence the job search pattern, and some accounting of them must be attempted.

A preliminary consideration of these factors was provided through an examination of the NLS Youth data. A subsample* of these data was useful for this purpose. A substantial group of persons in the sample had responded affirmatively in 1979, 1980, and 1981 to the question, Were you seeking employment during the four-week period prior to the interview? They answered

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*Because of the requirement that respondents must be searching for a job, this sample is a subset of the larger group of high school graduates whose responses were considered in subsequent analyses.

additional questions that provided an estimate of the degree to which the various job search strategies were used. A supplemental series of questions answered by this sample in 1981 also provided an estimate over a longer period about the success rate of the strategies used.

Job Search Strategies and Controlling Factors

A series of tables was prepared that showed the relationship between job search strategies and potential controlling factors, in addition to the factors of primary interest--vocational education and vocational speciality (e.g., trade and industry). Those variables included in the tables are as follows:

Potential Controlling Factors
- o School enrollment status
- o Educational level
- o Race and sex
- o Reason for job search
- o Type of job sought (e.g., full-time, part-time)
- o Current employment status

Job Search Strategies
- o State employment service
- o Private employment service
- o Direct employer contact
- o Friends and relatives
- o Advertisements
- o School employment services
- o Other methods

The probability of the effect of a job search strategy was tested by a chi-square test*, both for overall effect and for the relationship of each category of classifying factor to each of the job search strategies. The tables provide the overall percentage of the sample using each job search strategy (there are slight differences between tables due to rounding), and the percentage of each category of classifying factor using each strategy. The tables (numbers 2-1 through 2-9) are presented at the end of this chapter.

In general, the respondents in the NLS Youth sample reported using the strategy of directly contacting an employer most often

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*The significance tests reported in this discussion are chi-square tests of single cell deviations from expected frequencies with one degree of freedom. The expected frequencies are calculated by the generally accepted methods based upon the row and column marginals and the total number of cases.

(60-61 percent), followed by responding to advertisements (39-40 percent) and then seeking job information through friends and relatives (15-19 percent). The remaining strategies in frequency of reported use were use of state employment services (14 percent), school employment services (6-8 percent), private employment services (4-5 percent), and all other methods (9-12 percent). Despite careful wording of the survey question, it is possible that the frequency for direct employer contact was inflated because the respondents may have used more than one method, and all successful job searches eventually involved a contact with the employer. This perhaps encouraged respondents to report this approach to the exclusion of other methods. These percentages, however, form a basis for examining the possible influence of each of the mediating factors on selection of a job search strategy.

Job Search Strategies and Patterns of Participation

- Concentrators make above average use of state employment services.
- Concentrators make above average use of advertisements.

The effects of primary interests in this study are those of the patterns of vocational education participation. Examination of table 2-1* reveals no general effect of the patterns that are consistent across all three years of the survey data. Concentrators were more likely in 1979 and 1980 than Incidental/Personal participants or those with no vocational credits to use state employment services. But the relationship did not hold up in the 1981 data. Similarly, Concentrators were less likely than those other two groups to use friends and relatives as sources of job information. But in 1981, they used that source with about the same frequency as did Incidental/Personal participants.

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*Except as specifically noted, these and the following tables which show distribution of cases do so through the use of weighted percentages. This decision was made because the raw numbers following in each cell required readjustments to account for oversampling as identified in the chapter 1 discussion of the NLS Youth. The weighting results in estimated cell frequencies which are based upon the estimate total population at the time of sample interview. The percentages can represent the relationship with reasonable accuracy, whereas rescalling the cell estimated frequencies would introduce an additional source of rounding error. The reader is cautioned in those instances when the actual sample size for any category falls below twenty-five cases. Cases with missing data are excluded.

Concentrators were significantly more likely than the average to report use of advertisements in the 1980 survey (56 percent compared to 39 percent) and Concentrator/Explorers were about three times as likely to use private employment agencies as the average high school graduate in both 1979 and 1980. This trend did not hold for 1981. If contacting the employer directly or with the help of friends and relatives is more effective, vocational education should address this issue, perhaps by providing more effective job search orientation, or by arranging for effective employer contacts. (See also McKinney et al. 1981.)

Success Rates of Job Search Strategies

- Job search success through state employment services is inversely related to secondary vocational training.
- Concentrators are unusually successful users of newspaper advertisements.

Table 2-2 presents the relative success of the job search strategies. State employment services are particularly ineffective for Concentrators, but improve in effectiveness as vocational concentration decreases. Private employment services show a similar pattern. A reverse trend exists for school employment services. Concentrators and Concentrator/Explorers are most successful with newspaper advertisements. The relative lack of success of Limited Concentrators in use of advertisements does not have a readily apparent explanation. Trends are also not apparent for secondary vocational graduates in the successful use of direct employer contacts or contacts through friends and relatives, although some success is reported. The most successful users of these categories appear to be those with little or no vocational training.

The effect of vocational education on job search approaches can be seen another way in table 2-3. The use of the various strategies by different vocational specialists is tabulated here. The overall pattern reflects little deviation from the average use of each strategy among the specialties. Among the vocational education respondents, however, those who specialized in trade and industry were significantly more likely to report the use of friends and relatives in a job search. Another interesting trend is noted in the use of school employment service by those with no specialty, that is, those who took no vocational credits or who did not concentrate enough to develop a specialty. This significant trend, across all three survey years, will be further explicated in the tables showing the effects of enrollment and educational level. These data are shown in tables 2-4 and 2-5.

Strategy Use and Educational Enrollment

- o School employment services are primarily used by those enrolled, and rarely serve the job search process after graduation or school leaving.

Enrollment status is seen as a significant determiner of strategy use. Persons who were enrolled in school reported use of school employment services ten or more times as frequently as those not currently enrolled, and except for contacts through relatives and friends or directly with employers, this tendency was reversed for all other strategies. In the instance of the two exceptions, both groups reported about average usage of the strategies. Educational level was also clearly associated with increased use of school employment services. For those in the third and fourth years of postsecondary education, this strategy was reported at two to three times the average use. No other trends were evident relating to educational level, although there were isolated significant frequencies of possible interest.

First, all job searchers who were completing fifteen years of education reported making direct employer contacts in 1979, but only the average number made direct employer contacts in 1980 or 1981. Second, nearly twice as many respondents who had completed thirteen years of education reported use of school placement services in 1979. Perhaps this finding is a function of students taking short term programs of one year only in technical and community colleges. In any case, what has become evident from consideration of these last three tables is that the use of school employment services appears largely to be a function of current enrollment, program completion, or near approach to post-secondary program completion. School employment services are not seen as available or useful to those who have graduated or left school, for example, those who have lost a previous job (see table 2-7).

If use of school placement services is an effective job search strategy, there are policy implications in these findings which apply specifically to the secondary schools. Follow up programs providing job search assistance may be appropriate. Referring back to table 2-2, it may be observed that school employment services are somewhat effective for Concentrators and for those with no vocational education. To the degree that the services are not effective, then either improvements of the services or redirection of the users appears to be in order. The evidence on this point is therefore mixed (see McKinney et al. 1981, 1982).

Strategy Use by Race and Sex

- Black males and females are higher than average users of relatively unsuccessful state employment services.

There may also be differences in the use of the various job search strategies as a function of the race and sex of the respondents (table 2-6). Only two trends are observable in these data. Black males and females reported consistently above average use of state employment services. White males report consistently less use of advertisements. The situation with the black respondents indicates a possibly serious problem in job search strategy for these groups because the reported success rate for state employment services may be as low as 5 percent (Egan 1976). Moreover, the black respondents reported the lowest success rate for this strategy compared to other strategies with only one exception--school employment services for black males (table not shown). Since advertisements were also relatively unproductive, 12 percent, the tendency of white males to avoid this method may indicate more awareness of job search effectiveness. However, the more recent evidence presented in table 2-2 suggests the appropriateness of a change in use of advertisements.

Strategy Use and Reason for Search

- Those who have lost their jobs or are unemployed for other reasons tend to turn to the relatively unsuccessful state employment services.

The use of job search strategies may also vary as a function of the reason for the job search. Table 2-7 classifies the use of strategy by reasons. There were few trends observable in the data in this table. In the 1980 and 1981 data collections, those who had lost their jobs were significantly more likely to use state employment services, and those who were searching while employed are less likely to do so. This finding may be associated with the requirement that individuals must register with state employment services in order to qualify for unemployment compensation. Registration at the state employment service would be useful documentation of job searching for the unemployed. There seems, however, to be little meaningful association between job search strategies and reasons for engaging in the job search.

Table 2-8 categorizes the job search strategies by type of job wanted, that is, whether the job is part time, full time, or not specified. Part-time workers tend not to use the state employment services, but at least for the 1980 and 1981 surveys, they were more likely to use the school employment services. Otherwise, there are no trends in use of the search strategies by job types.

Strategy Use and Labor Force Status

Table 2-9 shows some interesting trends in the relationship of labor force status to job search strategy. There is a trend for the unemployed to make greater than average use of the state employment services and for those who were out of the labor force rather than employed to make less than average use of this service. There is also a trend for those out of the labor force to make less use of advertisements and more use of school employment services. This latter finding is consistent with the earlier trends noted for enrollment status and levels of education, because it is reasonable to assume that many students are out of the labor force, and are also the group most likely to use school employment services.

The Picture Overall

When the results are considered as a whole, the use of two job search strategies departed from the average most frequently across all categories. They are use of state employment services and use of school employment services. The groups who used them were not the same. The unemployed, blacks, those not enrolled in school, and those searching because of lost jobs turned to the state agencies. The school agencies were used by those just returning to the labor force, part-time workers, some of those seeking work because of hardship, those who had completed thirteen, fifteen or sixteen years of school, and those who were currently enrolled in school. Vocational education graduates were not confined to any of these descriptions, and did not have a significant deviation from the average of the population in a consistent way for any strategy. There were, however, several noteworthy exceptions.

Vocational Concentrators in two of the three years showed a slight tendency toward above average use of the state employment services, in which they were even less successful than the sample as a whole, which generally received a low percentage of job offers through this service. Also, they were slightly less likely to use the more successful approach of contacting friends and relatives than the remainder of the sample. Moreover, the Concentrators and Concentrator/Explorers were only half as successful in direct employer contacts as those with Incidental/Personal or no vocational training. On the positive side, Concentrators made average or above average use of advertisements in two of the three years. They reported substantially above average success with this strategy, as did the Concentrator/Explorers.

It thus appears that assistance in job search strategies is an appropriate policy consideration for vocational graduates. Perhaps they need specific assistance in presenting themselves in interview situations, in securing interviews, and in selecting

among the available job search strategies. These skills could be taught as a part of the vocational education curriculum, as some schools already do.

TABLE 2-1

THE USE OF JOB SEARCH STRATEGIES BY PATTERNS OF VOCATIONAL PARTICIPATION
(PERCENTAGE OF USE BY CLASSIFICATION)

	State Employment Service	Private Employment Service	Direct Employer Contact	Friends and Relatives	Advertisement	School Employment Service	Other
Concentrator							
79	16.4	8.2	68.4	17.4	40.7	3.2	7.5
80	20.5	5.7	57.0	12.6	56.1*	8.4	11.4
81	9.1	5.5	60.9	17.8	35.1	6.2	10.8
Limited Concentrator							
79	13.1	4.1	53.6	19.0	47.2	2.4	9.3
80	14.7	6.3	58.6	15.8	44.6	1.6*	6.6
81	21.0	9.3	53.2	24.2	39.5	6.1	15.9
Concentrator/Explorer							
79	14.4	15.5*	51.5	26.7	37.7	2.9	4.6
80	7.5	13.3*	52.6	19.1	35.1	5.3	7.1
81	22.0	5.7	57.2	15.1	50.9	4.5	11.9
Explorer							
79†	11.9	.0	86.8	3.0	48.9	.0	23.5
80†	15.7	.0	80.7	20.7	43.9	.0	3.7
81	18.5	1.6	42.3	9.9	53.6	13.5	7.4
Incidental/Personal							
79	14.4	2.5	62.2	20.5	39.1	6.0	16.7*
80	12.5	3.8	64.3	15.5	34.2	10.7*	9.8
81	14.6	4.5	56.2	17.4	46.2	9.1	15.5
Nonvocational							
79	9.7	4.1	52.2	20.4	42.0	13.3*	11.7
80	7.0*	6.5	57.9	17.2	34.2	10.6	14.0*
81	11.0*	5.3	56.5	20.5	41.8	9.8	12.3
Incomplete Transcript							
79	15.5	4.5	64.7	17.7	41.1	3.9	9.3
80	19.4*	.0*	60.2	13.8	42.6	7.0	7.7
81	17.4	7.0	59.4	19.7	44.6	4.9	11.7
Total							
79	14.0	4.8	60.5	19.5	41.2	5.5	11.5
80	14.2	4.1	60.2	15.4	39.4	7.9	9.3
81	16.0	6.1	57.1	19.3	43.8	7.0	13.2

NOTE: Percentages do not add up to 100 because more than one strategy could be used. The sample sizes for the 1979, 1980, and 1981 survey years were 1,186, 1,400, and 1,738, respectively.

*Probability $\leq$ .05

†Based on less than 25 cases

TABLE 2-2

SUCCESS RATES OF JOB SEARCH STRATEGIES BY PATTERNS OF VOCATIONAL PARTICIPATION
(PERCENTAGE OF SUCCESS BY CLASSIFICATION)

	State Employment Service	Private Employment Service	Direct Employer Contact	Friends and Relatives	Advertisement	School Employment Service
Concentrator						
No Offer	96.5	98.5	88.8	87.8	78.3	87.6
Offer	3.5	1.5	11.2	12.2	21.7	12.4
n	28	19	65	88	45	14
Limited Concentrator						
No Offer	93.2	91.0	82.2	80.7	91.0	91.7
Offer	6.8	9.0	17.8	19.3	9.0	8.3
n	65	43	123	153	95	28
Concentrator/Explorer						
No Offer	85.9	63.3	87.8	86.1	75.8	100.0
Offer	14.1	36.7	12.2	13.9	24.2	.0
n	40	23	74	86	61	16
Explorer						
No Offer	100.0	35.9	97.0	86.2	66.0	100.0
Offer	.0	64.1	3.0	13.8	34.0	.0
n	9	3	13	19	14	1
Incidental/Personal						
No Offer	94.0	87.0	77.6	83.2	81.4	91.2
Offer	6.0	13.0	22.4	16.8	18.6	8.8
n	112	66	244	280	183	71
Nonvocational						
No Offer	94.5	81.6	70.5	79.3	85.0	86.2
Offer	5.5	18.4	29.5	20.7	15.0	13.8
n	67	32	140	157	96	41
Incomplete Transcript						
No Offer	90.7	78.6	82.1	83.8	85.3	88.6
Offer	9.3	21.4	17.9	16.2	14.7	11.4
n	307	154	504	547	393	75
Total						
No Offer	92.3	82.6	80.1	83.0	83.8	89.9
Offer	7.7	17.4	19.9	17.0	16.2	10.1
n	628	340	1163	1330	887	246

NOTE: Percentages do not add up to 100 because more than one strategy could be used.

TABLE 2-3

THE USE OF JOB SEARCH STRATEGIES BY VOCATIONAL SPECIALTY
(PERCENTAGE OF USE BY CLASSIFICATION)

	State Employment Service	Private Employment Service	Direct Employer Contact	Friends and Relatives	Advertisement	School Employment Service	Other
No Specialty							
79	12.3	3.5	56.3	19.0	39.4	10.1*	14.4
80	9.6*	5.2	61.6	16.1	31.6*	11.9	12.5*
81	12.8	4.0	57.8	18.4	41.4	10.7	13.6
Agriculture							
79	4.8	.0	47.3	24.0	35.9	.0	9.0
80	20.9	8.0	52.0	23.7	22.2	11.3	.0
81	17.4	.0	58.0	14.3	34.0	6.6	16.4
Office							
79	14.7	6.2	60.4	22.0	43.2	4.6	13.4
80	11.5	7.3	60.7	13.5	43.5	6.9	8.6
81	14.6*	9.0*	53.6	18.1	47.2	7.5	11.9
Trade and Industry							
79	10.6	5.6	62.7	17.7	46.8	1.2	4.7
80	20.6	2.3	54.2	25.5*	44.5	3.0	16.0*
81	23.8	1.6*	55.4	25.4	35.4	4.2	21.3*
Distributive Education/Health/Home Economics							
79	17.1	4.3	55.7	18.1	29.1	5.9	7.5
80	10.1	5.0	59.6	19.4	33.5	1.7	1.9
81	19.6	.0	66.5	22.1	47.5	2.4	17.2
Incomplete Transcript							
79	15.5	4.5	64.7	17.7	41.1	3.9	9.3
80	19.4*	6.0	60.2	13.8	42.6	7.0	7.7
81	17.4	7.0	59.4	19.7	44.6	4.9	11.7
Total							
79	14.0	4.8	60.5	19.5	41.2	5.5	11.[illegible]
80	14.2	5.9	60.2	15.4	39.4	7.9	9.[illegible]
81	16.0	6.1	57.1	19.3	43.8	7.0	13.2

NOTE: Percentages do not add up to 100 because more than one strategy could be used. The sample sizes for the 1979, 1980, and 1981 survey years were 1,186, 1,400, and 1,738, respectively.

*Probability $\leq$ .05

†Based on less than 25 cases

TABLE 2-4

THE USE OF JOB SEARCH STRATEGIES BY ENROLLMENT STATUS
(PERCENTAGE OF USE BY CLASSIFICATION)

	State Employment Service	Private Employment Service	Direct Employer Contact	Friends and Relatives	Advertisement	School Employment Service	Other
Enrolled							
79	7.6*	2.1*	63.5	22.0	33.5*	12.0*	14.1
80	5.4*	3.1*	61.0	15.8	30.2*	19.0*	10.9
81	5.7*	3.1*	57.2	16.4	32.9*	20.5*	12.4
Not Enrolled							
79	18.7*	6.7*	58.4	17.7	46.8*	.8*	9.6
80	18.9*	7.5	59.8	15.2	44.4*	1.9*	8.4
81	20.1*	7.3	57.1	20.6	48.2*	1.6*	13.5
Total							
79	14.0	4.8	60.5	19.5	41.2	5.5	11.5
80	14.2	6.0	60.2	15.4	39.4	7.9	9.3
81	16.0	6.1	57.1	19.3	43.8	7.0	13.2

NOTE: Percentages do not add up to 100 because more than one strategy could be used. The sample sizes for the 1979, 1980, and 1981 survey years were 1,186, 1,400, and 1,738, respectively.

*Probability $\leq$ .05

TABLE 2-5

THE USE OF JOB SEARCH STRATEGIES BY LEVEL OF EDUCATION
(PERCENTAGE OF USE BY CLASSIFICATION)

	State Employment Service	Private Employment Service	Direct Employer Contact	Friends and Relatives	Advertisement	School Employment Service	Other
12 Years Completed							
79	16.2	5.7	61.8	18.1	42.4	3.0*	10.9
80	18.1*	6.1	60.6	16.0	45.8*	3.3*	6.2*
81	18.4*	5.2	58.8	21.0	46.8	1.9*	11.3
13 Years Completed							
79	11.6	3.3	55.5	21.8	40.3	9.5*	10.9
80	8.0*	4.2	53.6	15.5	30.3*	10.2	16.8*
81	15.8	7.8	56.0	18.5	40.1	7.2	17.5
14 Years Completed							
79	7.9	3.2	57.6	24.2	38.5	6.5	13.8
80	9.3	5.4	62.0	11.1	33.0	9.7	11.3
81	5.8	4.1	53.8	11.0*	36.0	16.7*	13.8
15 Years Completed							
79	5.2*	.0	100.0*	[illegible]	32.8	15.9*	14.6
80	6.9*	4.1	62.1	17.7	23.7*	29.9*	14.8
81	7.0*	5.3	51.9	17.7	33.8	34.9*	13.6
16 or More Years Completed							
79†	29.9	12.6	44.1	12.6	55.9	18.1*	14.2
80	8.2	14.7*	70.4	13.1	26.4	20.2*	10.2
81	17.9	18.3*	53.4	18.6	43.4	14.7*	25.1*
Total							
79	14.0	4.8	61.7	19.5	41.2	5.5	11.5
80	14.2	6.0	60.2	15.4	39.4	7.9	9.3
81	16.0	6.1	57.1	19.3	43.8	7.0	13.2

NOTE: Percentages do not add up to 100 because more than one strategy could be used. The sample sizes for the 1979, 1980, and 1981 survey years were 1,186, 1,400, and 1,738, respectively.

*Probability $\leq$ .05

†Based on less than 25 cases

TABLE 2-6

THE USE OF JOB SEARCH STRATEGIES BY RACE AND SEX
(PERCENTAGE OF USE BY CLASSIFICATION)

	State Employment Service	Private Employment Service	Direct Employer Contact	Friends and Relatives	Advertisement	School Employment Service	Other
Hispanic Male							
79	10.5	7.8	59.5	27.5	34.6	11.8	9.2
80	18.1	8.1	67.1	18.6	100.0*	2.1	6.8
81	19.1	3.9	54.0	22.6	45.6	5.2	14.7
Black Male							
79	22.6*	4.6	61.4	15.8	35.1	6.3	12.3
80	22.6*	3.9	59.5	11.7	33.9	4.9	11.5
81	25.3*	11.4*	56.6	22.7	42.3	4.9	10.7
White Male							
79	10.8	2.9	58.0	23.1	34.6*	5.6	12.6
80	15.1	4.7	61.8	18.1	34.5*	7.0	11.0
81	17.6	3.7*	57.8	20.4	37.6*	8.6	14.8
Hispanic Female							
79	10.2	2.0	62.1	17.0	46.6	12.1	11.2
80	11.5	8.2	51.7	17.5	46.2	19.1*	9.9
81	19.5	9.9	46.5	21.4	51.4	8.0	11.0
Black Female							
79	23.3*	7.9	57.4	11.6	42.8	4.2	9.7
80	22.4*	10.4*	63.9	8.8	44.2	9.9	7.1
81	23.0*	6.5	55.3	14.2	47.6	5.0	10.8
White Female							
79	14.0	5.9	63.2	18.2	47.7*	5.0	10.9
80	10.1*	6.5	57.8	14.1	44.8	8.6	7.7
81	10.2*	7.6	57.5	18.1	49.8*	6.2	12.4
Total							
79	14.0	4.8	60.5	19.5	41.2	5.5	11.5
80	14.2	6.0	60.2	15.4	40.1	7.9	9.3
81	16.0	6.1	57.1	19.3	43.8	7.0	13.2

NOTE: Percentages do not add up to 100 because more than one strategy could be used. The sample sizes for the 1979, 1980, and 1981 survey years were 1,186, 1,400, and 1,738, respectively.

*Probability $\leq$ .05

†Based on less than 25 cases

TABLE 2-7

THE USE OF JOB SEARCH STRATEGIES BY REASONS FOR SEARCH
(PERCENTAGE OF USE BY CLASSIFICATION)

	State Employment Service	Private Employment Service	Direct Employer Contact	Friends and Relatives	Advertisement	School Employment Service	Other
Involuntary Separation							
79	22.9	8.0	61.1	13.5	46.5	6.0	12.3
80	23.8*	8.6	68.2	16.3	41.3	2.3*	6.3
81	32.9*	5.1	57.5	27.1*	56.8*	7.6	14.3
Other Financial Hardship							
79	18.0	2.8	64.4	14.1	42.5	6.0	9.3
80	16.2	5.1	59.9	15.1	43.1	10.9	8.3
81	17.4	5.0	53.0	17.8	47.2	8.8*	11.5
Voluntary Separation							
79	19.1	5.6	66.9	23.8	40.5	2.6	3.9*
80	16.8	6.5	62.4	18.3	44.5	7.2	8.5
81	24.5*	8.2	62.7	18.6	48.8	5.9	9.2
Other							
79	7.9	.0	49.8	10.5	33.2	11.1*	25.3*
80	18.3	4.4	52.9	8.3	29.0	13.9	24.7*
81	16.5	8.0	57.2	14.7	26.5*	17.1*	15.6
While Employed							
79	11.0	5.7	60.5	21.5	42.4	5.2	10.7
80	9.7*	6.1	60.1	15.7	37.1	6.6	9.2
81	8.9*	6.4	59.0	18.7	40.8	4.8*	14.7
Total							
79	13.6	4.8	61.4	19.2	41.7	5.5	10.6
80	14.3	6.0	60.7	15.5	39.7	7.9	9.4
81	6.2	6.2	57.4	19.4	44.1	7.0	13.3

NOTE: Percentages do not add up to 100 because more than one strategy could be used. The sample sizes for the 1979, 1980, and 1981 survey years were 1,112, 1,390, and 1,727, respectively.

*Probability $\leq$ .05

TABLE 2-8

THE USE OF JOB SEARCH STRATEGIES BY TYPE OF JOB SOUGHT
(PERCENTAGE OF USE BY CLASSIFICATION)

	State Employment Service	Private Employment Service	Direct Employer Contact	Friends and Relatives	Advertisement	School Employment Service	Other
Part-time							
79	6.4*	4.2	54.3	26.3*	43.7	7.9	10.3
80	5.3*	3.1	54.7	14.2	42.7	18.7*	8.6
81	4.6*	1.9*	56.7	14.4	47.5	13.5*	10.8
Full-time							
79	15.5	5.0	62.7	18.0	40.9	5.1	11.8
80	16.2	6.6	61.8	15.8	38.9	5.7*	9.5
81	18.8*	6.9	57.4	20.2	43.3	5.9	13.6
Not Specified							
79	31.6*	2.4	42.7	20.6	35.7	.0	13.5
80	.0	.0	58.0	.0	80.0	.0	20.0
81	.0	.0	.0	14.7	24.3	.0	75.7*
Total							
79	14.1	4.8	60.8	19.6	41.4	5.5	11.5
80	14.3	6.0	60.5	15.5	39.6	7.9	9.3
81	16.0	6.1	57.2	19.3	43.9	7.0	13.2

NOTE: Percentages do not add up to 100 because more than one strategy could be used. The sample sizes for the 1979, 1980, and 1981 survey years were 1,182, 1,394, and 1,736, respectively.

*Probability $\leq$ .05

TABLE 2-9

THE USE OF JOB SEARCH STRATEGIES BY EMPLOYMENT STATUS
(PERCENTAGE OF USE BY CLASSIFICATION)

	State Employment Service	Private Employment Service	Direct Employer Contact	Friends and Relatives	Advertisement	School Employment Service	Other
Employed							
79	11.5	5.6	59.8	22.2	42.0	5.2	10.3
80	10.1*	6.4	60.4	15.9	38.6	6.8	9.2
81	11.5*	5.6	58.0	19.2	42.1	5.4	14.8
Unemployed							
79	23.6*	5.8	60.6	13.5*	46.4	3.2	12.5
80	24.8*	6.7	59.2	15.5	48.9*	6.4	7.5
81	25.7*	7.6	53.4	18.1	51.6*	6.8	11.5
Out of the Labor Force**							
79	6.8*	.2*	63.0	20.2	29.7*	10.4*	14.1
80	4.2*	2.2*	61.9	13.0	18.6*	15.9*	14.1*
81	7.0*	2.5	65.9	24.4	25.7*	16.9*	10.1
Total							
79	14.0	4.8	60.5	19.5	41.2	5.5	11.5
80	14.2	5.9	60.2	15.4	39.4	7.9	9.3
81	16.0	6.1	57.1	19.3	43.8	7.0	13.2

NOTE: Percentages do not add up to 100 because more than one strategy could be used. The sample sizes for the 1979, 1980, and 1981 survey years were 1,186, 1,400, and 1,738, respectively.

*Probability $\leq$ .05

**Status as of the interview week; however, these respondents reported looking for work within the past four weeks.

CHAPTER THREE

PRELIMINARY ANALYSIS OF POTENTIAL MEDIATING CONDITIONS

As described in chapter 1, this study was designed to examine the hypothesis that the effect of secondary vocational education upon earnings is indirect, being mediated through a variety of conditions that may or may not be independent of the secondary school curriculum. In this chapter, a set of preliminary examinations of several such conditions are reported. These were then used to select variables that are included in the regression models discussed in chapter 4.

The variables selected for the preliminary examination are suggested by the relationship postulated in figure 1-1, chapter 1. These variables, listed next, can be divided into two basic groups--Employment Stability and Regularity, and Types of Jobs.

Employment Stability and Regularity Variables include the following:

- Multiple job holding
- Total number of jobs held
- Weeks in the labor force per year
- Weeks worked per year
- Weeks unemployed per year
- Job tenure
- Employment experience
- Job separation

Types of Jobs Variables are as follows:

- Occupation
- Industry
- Job content
- Job family
- Job class
- Full-time/part-time jobs
- Unionization
- Size of firm
- Shift employment
- Available fringe benefits

The first set of variables was selected because it has an obvious impact on annual earnings. These data, for the most part, reflect the respondents' known work history up through the 1980 interview. The second group of variables is important because it has a more immediate effect on hourly earnings. These variables also provide indices of some of the possible trade-offs for earnings. The types of jobs variables are based on the most recent job the respondent held at the 1980 interview. If the

respondent held more than one job at the time of the survey, information from the principal job was used.

The analytic method used to investigate the possible relationships between participation in vocational education and these labor market indices was cross tabulations. For the majority of the analyses, significance tests for the independence of the categorizations were used. Except where indicated, the percentages shown in the tables are based on the weighted distribution of cases. Separate analyses are presented for men and women for most variables.

Employment Stability and Regularity

Multiple Job Holding

- Concentrators are more likely than other pattern groups to hold multiple jobs for four or more months; Concentrator/Explorers, Explorers, and Incidental/Personal graduates are slightly more likely to report working in multiple jobs at least three months.

Multiple job holding is defined here as having two or more jobs for pay in any given month.* The relevance of holding more than one job for vocational education lies in its inherent relationship with earnings, especially annual income. Several researchers have examined annual income without accounting for the seasonality of jobs or multiple job holding (Conroy 1979; Li 1981). Multiple job holding was examined for the complete sample of high school graduates and for those respondents not enrolled in school since 1977. The discussion is based on an analysis of the jobs held in 1978 and 1979.

The data show that approximately 1.5 to 2.5 percent of all respondents worked in multiple jobs in any month (table not shown). This estimate is lower than the national average, 4.5 to 5 percent, reported in recent years (Grossman 1975; Michelotti 1975, 1977). The discrepancy may be attributed to the age range covered in the NLS Youth data. The overall statistic reported in the literature is based on the full labor force. Young adults may not have the need or the opportunity to acquire more than one job at any one time. It should also be noted that in the national data, men and women generally show differential rates of multiple job holding. The small sample size for this variable in the NLS Youth, however, did not permit separate analysis by sex.

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*Multiple job holding was not considered to occur if the person was starting one job and leaving the other during the same month.

In terms of seasonality, for the full sample the multiple job rate appears to peak in July (4.1 percent in 1978, 3.7 percent in 1979). This finding possibly reflects college students engaging in summer work. Increases in multiple job holding were also found in October, November, and December; many respondents probably assumed an additional work load for the holiday season. The finding that only slight increases occurred during these months for the not-enrolled-since-1977 sample further suggests that seasonality in the full sample results from student behavior.

Determining the relationship between working in more than one job and the amount of vocational experience is a somewhat tenuous activity. Across the twenty-four-month period checked (not enrolled sample), Concentrators generally reported holding two or more jobs simultaneously more often than other vocational pattern groups. However, a higher percentage of Concentrators than other graduates were working, as opposed to being unemployed or out of the labor force. When the multiple job rate is computed as a percentage of those persons who are working, the tendency to be employed in two or more jobs is similar across the pattern groups. It should be noted that for this sample, in some months nonvocational youth more frequently reported having multiple jobs than other graduates, but there was not a clear-cut trend in that direction.

Additional insight can be gained when the number of months in which respondents worked at more than one job is examined (table 3-1). Among those not in school since 1977, Concentrator/Explorers, Explorers, and Incidental/Personal youth more frequently reported working at least three months in multiple jobs. Concentrators were the most likely, and nonvocational graduates the second most likely, to hold multiple jobs for four or more months over the two-year survey period, 12 and 9 percent respectively.

Number of Jobs

- For men who concentrated in vocational education there is a lesser tendency than other male graduates to have held four or more jobs. There is no clear trend in the number of jobs held for women.

Using data from both the 1979 and 1980 surveys, the total number of distinct jobs held was examined (tables 3-2 and 3-3). These data provide one indication of labor market stability. Although there is no established criteria for what constitutes a stable employment experience, it is generally agreed that excessive job changing is disruptive for employers and workers alike. For vocational education, the number of jobs held is an important issue that reflects the level of adjustment experienced in the

school to work transition. Annual earnings are also strongly influenced by the number of jobs.

When the total number of jobs held by men is examined, those men who concentrated in vocational education were more likely to have held either two or three jobs than to have held only one or more than three. Concentrators and Concentrator/Explorers, relative to their proportion in the sample, were as likely as other respondents to have had only one job and were more likely to have been employed in two jobs. In the nonenrolled group, for example, the overall estimate for two jobs was 30 percent. Over 37 percent of the Concentrators and 36 percent of the Concentrator/Explorers were found in this category. Concentrators and Limited Concentrators were more likely to report having held three jobs. All three vocational concentrator patterns showed a lesser tendency to have held four or more jobs. These trends were consistent between the two samples.

In addition, the data show that men who had minimal or no involvement in vocational education were changing jobs more frequently than all graduates in general. For example, in the sample of those who were not enrolled, approximately 15 percent of the nonvocational males had held four or more jobs; the expected frequency for all respondents in this sample was approximately 10 percent.

These patterns of job holding also applied when different types of jobs were counted. Specifically, the types of jobs included: full-time jobs (working thirty-five or more hours per week); jobs with at least four months tenure; full-time jobs of at least four months duration; and jobs held for less than four months. The notable highlights were that Concentrators were much more likely than other respondents to have held at least one full-time position and that those in the concentrator groups were less likely than other graduates to hold jobs for less than four months. Males without vocational training were significantly more likely than vocational Concentrators to have held four or more short-term jobs (less than four months tenure). However, when limited to jobs of at least four months tenure, nonvocational youth showed no tendency to hold four or more jobs more often than other respondents. These findings suggest that compared to other graduates, nonvocational males change jobs more frequently and therefore appear, at least in a preliminary sense, to have less stability in their early labor market experience. These tendencies are exhibited for both the full sample and for the sample of those not enrolled since 1977. Because these tendencies were consistent between the two samples it is unlikely that the more frequent job changing by nonvocational males can be attributed to short-term employment associated with postsecondary schooling.

Among women, fewer consistencies across the types of jobs and between the vocational pattern groups were found. Looking first at the total number of jobs held, Concentrators were more likely than other female graduates to report holding at least one job and were much less likely to have held two. These results were significant for women who had been out of school since 1977. Approximately 52 percent of the Concentrators had been employed in one job compared to a 38 percent average for all graduates; the estimates for having two jobs were 20 percent for Concentrators and 35 percent for all others. Not enrolled Concentrators did show a slightly higher percentage than average in the three-job category.

Overall, there does not appear to be a tendency for women with vocational training to be either more or less mobile than other women. In the full sample, Concentrators, Limited Concentrators, and Concentrator/Explorers did show an increased tendency to hold at least one job for four or more months, and conversely, Incidental/Personal and nonvocational women were significantly less likely to have maintained a full-time job for this period of time. Again, this probably reflects the higher postsecondary schooling rates of these latter women; the significance levels drop substantially and more often become insignificant for the nonenrolled sample. Interestingly, for both samples and both types of jobs, women with a Concentrator-type experience were significantly more likely than others to report having four or more jobs.

The tendency for nonvocational males to have held a number of jobs for less than four months was not evidenced among nonvocational women. Also, compared to men, women tended to change full-time jobs less frequently, but for both sexes, persons not enrolled in school since 1977 were more likely to have held several jobs.

Weeks in the Labor Force

- In general, persons with any level of concentration in secondary vocational education are more likely than Incidental/Personal and nonvocational youth to be in the labor force for a full year. Differences between the concentration groups are noted, however, within the male and female samples.

To obtain a broad picture of the differing rates of labor force participation by persons of various educational backgrounds, cross tabulations were performed using number of weeks in the labor force for calendar years 1978 and 1979. To count as a week in the labor force the respondent must have been either working or looking for work. The data are presented separately by sex for two samples: graduates not enrolled in the survey

year and those with exactly twelve years of education (see tables 3-4 through 3-7).

For men in both samples and for both years examined, Limited Concentrators and Concentrator/Explorers were substantially more likely to be in the labor force for a full year than nonvocational and Incidental/Personal graduates. To illustrate, using the sample of those with exactly twelve years of education, in 1978 approximately 78 percent of those in each group were participants in the labor force for fifty-two weeks; the comparable percentages for nonvocational and Incidental/Personal graduates were 60 and 58. The following year, about 70 percent of the Limited Concentrators and Concentrator/Explorers were in this category, compared to an estimate of 60 percent for nonvocational and Incidental/Personal men. It should also be noted that Limited Concentrators were significantly less likely to report being in the labor force for less than twenty-five weeks in the calendar year 1978.

Concentrators, those with the highest level of vocational training, were also more likely than nonvocational males to be in the labor force for a full year. The difference between Concentrators and Incidental/Personal and nonvocational youth, however, was negligible.

Unlike male Concentrators, women with a similar vocational background reported more frequently being in the labor force for fifty-two weeks than did other female graduates. The differences were maintained for both samples and both calendar years and were statistically significant in each example.

Limited Concentrators and Concentrator/Explorers also showed marked differences in this category compared to Incidental/Personal and nonvocational women. The percentages of participation for fifty-two weeks were very similar between the two vocational concentration groups, ranging from 45 to 52 percent, and were consistently higher than the estimates for women with minimal or no vocational experience.

While the data suggest that youth with increased vocational education are more likely than nonvocational youth to remain in the labor force for a full year, the number of weeks in the labor force does not necessarily indicate more employment. Measures of weeks worked and weeks unemployed provide additional insight into this question.

Weeks Worked and Weeks Unemployed

- Overall, males with any substantial investment in vocational education are more likely than other men to report working at least half of the year whereas

among females the groups which exhibit similar tendencies are Concentrators and Limited Concentrators.

- Both males and females with a concentrator-type vocational background consistently report a higher likelihood of never being unemployed than the overall within-sex estimates.

Stability in the labor market indicates one's ability to make a satisfactory adjustment to the work environment and has a direct effect on annual earnings. Two measures of stability are the number of weeks worked per year and the number of weeks unemployed. The same samples were used here as in the discussion of weeks in the labor force.

Table 3-8 shows the percentage distribution of weeks worked for the full sample of men. For both years, Concentrators, Limited Concentrators, and Concentrator/Explorers, more often than other respondents, reported working at least half of the year. Across the two years, Concentrator/Explorers showed the largest percentages for working at least twenty-seven weeks. When the analysis was restricted to men with no more than twelve years of schooling (table 3-9), similar patterns were found. The differences by vocational experience, however, were somewhat less pronounced for 1979, particularly for Concentrators and Limited Concentrators. Overall, significance was not achieved in the weeks-worked tables.

When the number of weeks worked per year is examined for women, stronger differences emerge for specific vocational pattern groups (see tables 3-10 and 3-11). Concentrators, Limited Concentrators, and Incidental/Personal participants show greater tendencies than those with no vocational credits to work at least twenty-seven weeks in 1978; only for the Concentrator group, however, was the difference significant compared to the expected frequency in a chi-square test. The tendency for Concentrators and Incidental/Personal graduates to work more frequently for at least twenty-seven weeks was maintained for 1979.

As with the full sample, female Concentrators and Limited Concentrators who had not been enrolled since 1977 were more likely to report working twenty-seven or more weeks in 1978. In 1979, all three levels of vocational concentration plus the Incidental/Personal group exhibited higher percentages than the total estimate for this category. Other findings for this subsample remained consistent with those found for the full sample.

All three groups of male vocational concentrators showed a higher likelihood of never being unemployed in both 1978 and 1979; this result was upheld for both the full sample (table 3-12) and for the sample of those who completed exactly twelve years of education (table 3-13). Only Concentrators in the

latter sample, however, were significantly more likely than all graduates to report no unemployment.

For women in 1978 and 1979 and for both the full sample (table 3-14) and no postsecondary education sample (table 3-15), conclusions similar to those for the male graduates are derived. Concentrators, Limited Concentrators, and Concentrator/Explorers were usually more likely than Incidental/Personal participants and nonvocational graduates to report no unemployment. While the results are generally consistent, the chi-square tests do not show significant differences between vocationally-educated and other respondents. In 1978, for both samples, Incidental/Personal women also showed a greater likelihood of having no unemployment experiences, but in 1979, they were less likely to fall into this category than was expected. Nonvocational female graduates were consistently less likely than all other graduates combined to show zero weeks unemployment. Interestingly, less than 1 percent of those in the three concentrator pattern groups were found in the high unemployment range (more than half a year) in 1979. The results were maintained for both samples and were significant for Concentrators and Limited Concentrators.

Tenure

- For males and white females who have not been students for at least two years, higher vocational concentration is associated with one to two months longer job tenure.

Tenure on the job is an indirect reflection of the number of jobs that people have and is a direct indicator of stability and employment. But longer tenure or greater stability is not necessarily to be preferred. Longer tenure can be advantageous if a person is in a preferred job that has a clear promotion ladder. It is not necessarily beneficial if a person is in an undesirable job with low pay and poor working conditions. In most studies, however, longer tenure has been associated with higher earnings. This result suggests that, on the average, the former effect tends to outweigh the latter.

A word of caution is required here. The measure of tenure that is used here is in several respects incomplete. It reflects tenure on the job as of the interview date; it does not reflect differences in the average length of completed job experiences. Also, the tenure measure reflects tenure with an employer, not tenure on a specific job. In that sense it does not conform precisely to the definitions of tenure in other studies of labor market effects. Nevertheless, the interpretation of long tenure as an advantage actually better fits the concept of tenure with a specific employer than it does tenure on a specific, narrowly defined job.

The most important subsample to consider here is those respondents who had not been enrolled since 1977. In that sample, tenure reflects more their labor market behavior than their entrance or exit from the labor force as students. However, the effects of entering or leaving the labor force for reasons other than education are still factors for this sample. This problem may be especially important for women, but it is difficult to estimate from the data that are available. Differences between the full sample and the sample of those not enrolled since 1977 may be attributable to respondents who enter and leave the labor force to further their educational opportunities. What cannot be distinguished here is the effect of entering or leaving the labor force as a discouraged worker. To the extent that there are differences attributable to the discouraged worker phenomenon, those groups that are more responsive (that is, that leave the labor force more rapidly when the job market deteriorates) would be expected to have shorter tenure. The differences in tenure between racial groups tend to support this conjecture. Minority men and women seem to have had shorter average tenure than their respective white counterparts (tables 3-16 and 3-17). Also, with the exception of minority women who have not been enrolled since 1977, men exhibit longer average tenure than women. This finding most likely reflects the tendency of men to participate more fully in the labor force.

The results for tenure show that for men, Concentrators, Limited Concentrators, and Concentrator/Explorers had somewhat longer tenure on the current job (1980 survey) than did Incidental/Personal participants or respondents with no vocational credits. The difference is between three and five months in the full sample, but that difference narrows for students with no vocational credits when the sample of people who were not enrolled since 1977 is considered.

Thus, for men who have not been enrolled in school for at least two years, higher concentration in vocational education is associated with longer tenure on the job. In part this contrast between vocational and nonvocational or Incidental/Personal students is attributable to the skewness of the distribution of Concentrators. Median tenure tends to be much closer than mean tenure among people with different patterns of participation. Longer mean tenure for Concentrators, therefore, is attributable primarily to a fairly small number of people in the tail of the distribution of Concentrators who have very long tenure.

Sharp differences can be seen between white female and minority female vocational education graduates in terms of the amount of tenure accumulated. Among white females, Concentrators have the highest average tenure of any pattern group by about four to five months. That difference is more pronounced when the sample is restricted to those respondents who had not been enrolled since 1977. Limited Concentrators, Concentrator/

Explorers, Incidental/Personal participants and those with no vocational credits are fairly close together.

For minority females in all samples, Concentrators have longer average tenure than Concentrator/Explorers, who in turn have longer tenure than Limited Concentrators. But Incidental/Personal participants and those with no vocational credits have greater tenure than Concentrators in all samples. Sometimes the difference is as much as five months.

Thus, for males and white females, concentration in vocational education tends to be associated with longer tenure and hence with greater stability. For minority females, however, concentration is associated with shorter tenure on the job. Whether this stability should be interpreted as reflecting advantages or disadvantages for vocational graduates requires the more detailed consideration of job characteristics that follows later in this chapter.

Employment Experience

Experience in employment is a counterpart of tenure. In order to acquire tenure, it is necessary to acquire employment experience. Experience reflects the opportunities an individual has had to accumulate general human capital, whereas tenure usually reflects opportunities to acquire specific human capital. In that sense, employment experience and tenure reflect complementary aspects of the accumulation of human capital outside of formal education. Employment experience is measured here as the reported number of months worked since 1975, as of the 1980 interview (tables 3-18 and 3-19).

Among white men and women, there are no observable trends for experience across the pattern groups. There is no clear tendency for respondents with more vocational education to have accumulated more or less employment experience than people without vocational education.

For minority men and women however, some patterns do emerge. Concentrators and Concentrator/Explorers seem always to have accumulated less labor market experience than Incidental/Personal participants or graduates with no vocational credits. The only difference in this pattern is that among minority men, Limited Concentrators tend to accumulate more work experience than Incidental/Personal participants or those without vocational education. Minority women who followed a Limited Concentrator pattern, however, have less employment experience than Incidental/Personal graduates and than those with no vocational education. These results suggest that minority respondents with vocational education tend to have accumulated somewhat less employment experience than persons with minimal or no vocational

education. Whether this indicates a greater preference for work among nonvocational students or whether it indicates a greater emphasis among vocational education students on acquiring their skills through formal education is a question that remains to be answered.

Job Separations

- No clear relationship emerges for men or women between concentration in vocational eudcation and the frequency of either voluntary or involuntary job separations.

At least four principal hypotheses have been offered to explain the high unemployment rates experienced by young people. First, it is argued that the youth themselves are unstable, that they simply jump from job to job with no serious commitment to either the labor market or to any of the jobs that they obtain. In this hypothesis, the fault lies with the individual young people and their unstable behavior. Moreover, the unstable behavior is viewed as having no serious rational purpose. The second hypothesis also attributes the large unemployment to rapid turnover at the initiative of youth. By this hypothesis however, the rapid turnover is purposeful. It constitutes an intentional effort to learn about the job market and about different jobs and is characterized as an experience search by Leighton and Mincer (1979). The third hypothesis fits well with Doeringer and Piore's (1971) theory of the dual labor market. This theory maintains that youth usually can obtain only undesirable jobs. These jobs are of uncertain duration, offer few incentives for youth to attach themselves to the job and few fringe benefits, and provide little opportunity for growth and development. In this view, youth voluntarily turn over rapidly, but the fault lies with the jobs more than with the youth themselves. The fourth hypothesis is that young people as a group are among those with the least to offer the labor market. Moreover, youth, in much the same way as women and minorities, are discriminated against and are among the last hired and the first fired. Hence, variations in the strength of labor market demand are the principal reason more young people experience frequent separations. In this view, the fault lies primarily with the instability of the economy and with the way that hiring decisions are made.

The first three hypotheses are all consistent with a large rate of voluntary turnover. The fourth hypothesis is consistent with a high rate of involuntary turnover among youth. The issue for this report is whether young people who participate in vocational education are more likely to fit one mold more than any other. The answer to this question must draw on more information than simply the pattern of job separations. But any patterns that emerge showing clear differences in the separation behavior

of former vocational students compared to former nonvocational students could throw some light on the question at hand.

No clear patterns of job separation seem to emerge for men (table 3-20). In any one year, there were statistically significant differences in the distribution of separations by the patterns of vocational participation. But frequently those differences were reversed in the 1979 and 1980 surveys. For example, male Concentrator/Explorers show a significantly greater likelihood of involuntary separation and significantly smaller likelihood of hardship or voluntary separation in 1980. In 1979, however, Concentrator/Explorers show a greater likelihood of voluntary separation than do respondents who fall into the other patterns. A second example concerns male Concentrators; they were less likely in the 1980 survey to report involuntary separations. But if the sample is restricted to respondents who were not enrolled since 1977, Concentrators in 1979 were significantly more likely to be involuntarily separated.

For women there is a slightly clearer pattern for the full sample in both 1979 and 1980 (table 3-21). Concentrators and Limited Concentrators are more likely to be voluntarily separated than are Incidental/Personal participants or those with no vocational credits. However, some of the same ambiguity characterizes the women's data as characterizes the men's. Concentrator/Explorers, for example, are more likely to be voluntarily separated in 1980 and significantly less likely to be voluntarily separated in 1979.

Overall, there is no clear tendency for respondents with concentration in vocational education either to get into undesirable jobs or to be unstable in the labor market. If vocational respondents were more likely to fit those descriptions they ought so experience greater voluntary separation than other students. But they do not, according to these data from the NLS Youth. The results show that there is no apparent tendency for vocational students to be more or less likely to seek rapid advancement. If they did, they should show either or both of the following tendencies: a higher likelihood of voluntary separation and a greater likelihood of searching while employed.* The data reveal neither of these patterns.

One reason that is often suggested for the first hypothesis (i.e., unstable behavior by youth) is that young people are frequently entering and leaving the labor force as they return to education or as their educational year comes to an end. That is, there are seasonal variations in youth labor force participation

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*See chapter 2.

attributable to their educational commitments. If this hypothesis were correct, we ought to see substantial differences between the job separation behavior of the full sample and the behavior of those who had not been enrolled since 1977. These data do not exhibit such substantial differences. There is not even a tendency for those who had not been enrolled since 1977 to exhibit fewer separations of any kind than for the sample as a whole.* Finally, there seems to be no evidence to suggest that former vocational students are more or less likely than anyone else to get into jobs that are more prone to layoffs. If they were, they would be likely to experience higher involuntary rates of separation; the NLS Youth data suggest that this is not the case.

Types of Jobs

In addition to the variation associated with differing patterns of vocational education in terms of job stability and regularity, there is some variation, similarily associated, in the types of jobs held. These types represent differences in occupation, industry, job content, job family, and job class. As used in this discussion, occupation refers to categories such as professional, crafts, operatives, service worker, or laborers. Industry refers to categories such as construction, transportation, entertainment, and public administration. Job content is expressed on a five-point scale developed by Scoville (1969), which relates factors such as general education and spatial ability to the median income of groups of jobs. Job family refers to categories such as tools (specialized), inspection, education, or administration. Job class distinguishes types of employers: private, public, or self-employment. Other job characteristics included in this section are hours worked per week, unionization, size of firm, shift employment, and availability of fringe benefits.

The principal concern of this study, to reiterate, is the effects of secondary vocational education on subsequent labor market experience. As pointed out in the opening remarks of this chapter, those effects are expected to function through intervening variables rather than directly. When stability of employment or wage rates are the labor market outcomes of interest, the characteristics of jobs discussed in this section can have profound effects. Therefore, an understanding of the possible tendency for secondary vocational education to channel people toward jobs with certain characteristics is a first step in explaining the effects of interest.

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*1980 does exhibit such a tendency, 1979 does not.

Occupation

- Males with secondary vocational training are more likely than average to be in craft occupations.

- Females with secondary vocational training are more likely than average to be in clerical occupations.

Table 3-22 shows the distribution of the vocational patterns by occupation. Both men and women who show some level of concentration in vocational education are less likely to be in the professional and technical occupations. The effect is significant for female Concentrators and for male Concentrator/Explorers. Although not significantly different at the generally accepted levels in chi-square tests, the percentages for Limited Concentrators and the other patterns showing a degree of concentration for the two sexes are all less than the average for the sample.

A somewhat similar pattern emerges for the crafts occupations. Male Concentrators, Limited Concentrators, and Concentrator/Explorers are all more likely to be in crafts occupations; significance was achieved for the first two patterns. The women who are in crafts occupations are more likely either to be Concentrator/Explorers or to have incomplete transcripts. No interpretation of the finding related to incomplete transcripts is feasible, although speculation would suggest that missing or incomplete transcripts are associated with a high degree of transience, which may in turn be associated with the type of job chosen. Both operative occupations and household service occupations are significantly more likely to be held by respondents with incomplete or missing transcript records.

Men and women without vocational training are likely to be in sales positions. In contrast, members of both sexes who are vocationally trained are significantly less likely to be engaged in service occupations. The major occupational difference between men and women occurs in the clerical occupations. About 44 percent of all women in the sample reported such occupations, while only 11 percent of the men reported jobs of this type. Female Concentrators and Limited Concentrators are substantially and significantly more likely to be in clerical occupations but, in the case of the men, vocational education appears to have had no effect on this occupational choice.

One additional vocational effect was confined to men. No women reported themselves to be farmers, but of the men who so designated themselves, the majority were either Concentrators or Limited Concentrators. Although this finding is consistent with other data on vocational concentration (Campbell, Orth, and Seitz 1981), the number of cases is too small to warrant any firm conclusion.

Industry

- Male Concentrators, who are heavily represented in the agriculture specialty, are more likely to be employed in that industry.

- Male and female Limited Concentrators have above average representation in the construction industry.

The associations of secondary vocational education patterns with the industries in which the respondents reported having worked are presented in table 3-23. Few effects for the vocational patterns are observed in this table. As expected, the number of male Concentrators who specialized in agriculture and later work in agricultural jobs is sufficient for the group of all Concentrators to be significantly more likely to be employed in this industry. Also, both male and female Limited Concentrators were significantly more likely to be employed in the construction industry than the average percentage of any other secondary education pattern. Men who had no vocational education were significantly less likely to be in construction, but the effect of this pattern was neutral for women. Incidental/Personal females were quite likely to be in trade and in entertainment, and Incidental/Personal males showed a significant tendency to be in public administration. These are relatively isolated findings that do not appear to constitute a theoretically meaningful pattern of association. The consistent finding for agriculture and the interesting finding for both sexes in construction would appear from simple cross tabulations to be the most meaningful effect of vocational education on choice of industry. A stronger pattern of association is evident in the multivariate analysis of industry presented in chapter 4.

Job Content

- Secondary vocational education is associated quite strongly with middle level job content.

A broad, general estimate of the value of the abilities required to perform a job successfully is expressed by a scale of job content. The interaction of this scale and the patterns of vocational participation at the secondary level are presented in table 3-24. The higher numbers on the scale are associated with low market values (predicted by Scoville's model (1969) of job content) for the levels of ability and educational development required for an occupation. Simply put, a five on the scale indicates the lowest level of content, and a one indicates the highest level of content.

The strongest patterns of association occur for women on this variable. Female Concentrators are more likely to be in the

middle category of job content, significantly less likely to be on either side of this category, and also less likely, although not strongly so, to be in either extreme category. Female Limited Concentrators present the same pattern exactly, although not as definitively. Incidental/Personal women are significantly less likely to be in the middle category and more likely to be in the low category. On the other hand, women with no vocational training in high school are significantly more likely to be in the highest two levels of job content.

Men follow the same pattern of association, although the differences are not as pronounced. Male Concentrators spread across the three middle levels of job content. Male Limited Concentrators are strongly represented in the middle level and have less likelihood of being in the two adjacent levels, both higher and lower, just as the women do. The Incidental/Personal males are also less likely to be in the middle content category, but not significantly so, and are otherwise very similarly distributed in comparison to the total group of males. Whereas females with no vocational training are more likely than average to be in the higher job content levels, males with similar training patterns show negligible differences from the average distribution. One interesting observation in this table is the significant likelihood of both male and female Explorers being in the fourth lowest job content level. The number of cases is small, but the presence of this tendency in separate male and female samples suggests something other than an artifact of analysis.

In general, vocational education appears to be associated quite strongly with middle-level job content. Also, very few graduates with vocational training fall in the highest level, and although substantial numbers are found in the lowest levels, those with substantial attainment in vocational education tend to be less likely than the average to be in that job content classification. The age range of the NLS Youth Cohort, seventeen to twenty-six, may be a factor in the small number of observations at the highest content level.

Job Family

- Female Concentrators and Limited Concentrators move into the clerical job families in relatively higher proportions than other female graduates.
- There is a trend for males with substantial vocational concentration to be employed in the nonspecialized tool job family.

Secondary vocational education appears to have some influence on the job families in which young workers are classified. Like job content, the job family categories correspond to those

used by Scoville. They were derived to complement the job content scale and to categorize workers more homogeneously than do the standard census occupational categories. Table 3-25 presents the associated distribution of the respondents by job family and pattern of vocational participation.

Female Concentrators are much more likely than the group average to be in the clerical work category. This finding also holds true for Limited Concentrators, but not for any other pattern of secondary school curriculum. On the other hand, the number of female Concentrators in health occupations is significantly less than other pattern groups, whereas those with no vocational training are significantly more likely to be in this job family. This finding may be attributed in part to the requirement of postsecondary education for many health occupations and to the higher rates of postsecondary attendance for nonvocational youth (Campbell, Gardner, and Seitz 1982). The other patterns show only trivial deviations from the average. Female Concentrator/Explorers show a somewhat greater tendency to be in sales positions requiring product knowledge and in nonspecialized manufacturing jobs. This latter field appears to be significantly avoided by the Limited Concentrators, but such avoidance does not show an apparent trend if one examines the frequency for Concentrators. Personal service along with health, on the other hand, appear to be an unlikely place for vocational graduates to be found.

For men, the trends are even more sparse. The Concentrator pattern is strongly positive among farmers. Limited Concentrators and Concentrator/Explorers show a slight, similar tendency. All three of the vocational patterns with substantial concentration show greater than average percentages in the nonspecialized tool family. Although these percentages do not achieve individual significance, it is unlikely that the consistency could be due to chance. The opposite trend is significantly present for those men with no vocational training. The remaining significant frequencies are scattered, with no supporting trends.

Overall, job families with higher or lower content, represented by research on the one hand and personal service on the other, do not appear to be the job families in which vocational graduates are found.

Job Class

- Male Concentrators are above average in self-employment.

This section presents the associated frequencies for job class and vocational participation. The four job classes shown in table 3-26 are private, government, self-employment, and

family employment. There are no trends in common between men and women in these data. The more concentrated in vocational education the men are, the less likely they are to be in government employment. A slight, opposite trend appears for women, although no frequency deviates significantly from the average in their case.

There is one unusual and significant contrast, although the number of cases is small; male Concentrators are significantly more likely than the average to be self-employed. This finding was even more pronounced in a separate analysis done for those respondents who had not been enrolled since 1977. For women, it is those who are without vocational training who are more likely to be self-employed. This suggests possible differences in the types of vocational training followed by the sexes, and in the types of self-employment in which they may engage.

Full-time/Part-time Jobs

- Male vocational Concentrators are significantly more likely than other graduates to work either thirty-five to sixty or more than sixty hours per week; females with a similar vocational experience are also more likely to hold full-time jobs and less likely to work part-time.

The distinction between full-time and part-time jobs (as measured by hours worked per week) not only conveys information about the time spent on the job, but gains importance because it is intrinsically related to weekly and annual earnings. For the full sample, vocationally educated graduates showed a greater tendency to be steadily involved in full time-work. Over four-fifths of the male Concentrators reported in the 1980 survey that they usually worked at least thirty-five hours per week (see table 3-27). Concentrators were significantly more likely than all graduates to work either thirty-five to sixty or more than sixty hours per week. Conversely, males with a substantial involvement in vocational education were significantly less likely to be in part-time employment. The pattern for nonvocational youth was opposite that found for Concentrators and was especially evident in the lower (zero to twenty) and upper (sixty plus) hour ranges.

Notable differences in these patterns were discovered when the sample was reduced to those not enrolled since 1977. Nearly all (92 percent) of the male Concentrators were employed in full-time (thirty-five or more hours per week) positions. A substantially higher percentage of male Concentrators than of other respondents were found in the sixty plus hours category. Because of the large percentage who worked very long weeks, Concentrators were actually less likely to work thirty-five to sixty hours

compared to all other pattern groups, excluding Incidental/Personal youth. Also, Limited Concentrators and Concentrator/Explorers worked thirty-five to sixty hours per week more often than did Incidental/Personal participants or those with no vocational credits. In terms of part-time work, Concentrators also showed a stronger tendency to work fewer hours (less than twenty) than the overall estimate (7 percent compared to 3 percent).

The hours per week data for women are presented in table 3-28. For the full sample, female Concentrators demonstrate patterns similar to those found among male Concentrators. Although not strictly significant, women with increased vocational experience were most likely to hold full-time jobs and were less likely to work part time. Limited Concentrators were significantly less likely to work zero to twenty hours than all graduates combined. While a large percentage of Incidental/Personal and nonvocational women were working full time (approximately 50 percent), they were significantly less likely to do so than Concentrators. These women showed strong tendencies to work less than twenty hours and, for the former group, a significantly higher percentage worked less than thirty-five hours. As for men, these findings are probably linked to participation in postsecondary education. When the sample of those not enrolled since 1977 is examined, the most notable observation is that the percentages of women who worked zero to twenty hours dramatically drops and the frequency of those working full time substantially increases. Patterns similar to those found with the full sample are maintained for Concentrator and nonvocational women when the sample of those not enrolled is examined. In particular, women with a Concentration-type vocational background were much less likely to have worked between twenty and thirty-five hours per week.

Unionization

- Male Concentrators are much less likely than other men to be in unionized jobs; female Concentrators are neither more nor less likely than other women to be unionized.

There are interesting relationships involving unionization* among the vocational pattern groups both within and between sexes (table 3-29). Among men, Concentrators were much less likely to be in unionized jobs. Overall, 26 percent of white males were in unionized jobs, but only 16 percent of white male Concentrators had such jobs. For Limited Concentrators and Concentrator/Explorers, the percentages are closer to the average, about 26

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*Jobs were considered unionized if respondents reported that their wages were determined through collective bargaining.

percent and 21 percent respectively. Incidental/Personal graduates and those with no vocational credits have percentages of about 34 percent and 30 percent respectively, or over twice the percentage of Concentrators. The relationship is repeated among the vocational patterns when the sample is restricted to equal amounts of education (those with exactly twelve years of education) or to males who had been out of school for at least two years (those not enrolled since 1977). Overall, for white males, Concentrators show a lower percentage of unionized jobs, Limited Concentrators and Concentrator/Explorers have somewhat higher percentages, and Incidental/Personal males and those with no vocational credits the highest percentages.

Among minority men, the relationship between Concentrators and other patterns is similar to that for white men, although the overall level of unionization is about six to ten points higher for minority men, depending on which sample one examines. The difference between minority men and white men is that, for minority men in either the full sample or the sample with exactly twelve years education, there is no significant difference between Limited Concentrator, Concentrator/Explorer, and Incidental/Personal participants and those with no vocational credits. In fact, when the sample is restricted to those with exactly twelve years of education, Concentrator/Explorers show the highest percentage of unionization among any of the participation patterns.

The unionization pattern for men can be summarized by saying that vocational Concentrators were much less likely to be in unionized jobs. Another table (not shown) indicates that these differences are primarily attributable to the tendency for Concentrators who are crafts members and crafts workers in manufacturing to be in nonunionized jobs. This finding has important implications for the later discussion of the determinants of earnings and income.

The incidence of unionization for women shows a pattern for Concentrators that is just the reverse of the pattern displayed by men. Women Concentrators were more likely to be in unionized jobs than were women with other patterns of participation in vocational education. The differential is small for white women but is very large for minority women.

Other relationships among the patterns are less important and less pronounced. For white women, Concentrator/Explorers and Concentrators show about the same frequency of unionization. Limited Concentrators show far less unionization. Among minority women, Limited Concentrators and Concentrator/Explorers are very much like women with very little or no vocational experience, at least in the sample that is restricted by education. Minority female Limited Concentrators and Concentrator/Explorers who had

not been enrolled since 1977 were much less likely to be unionized than were similiar Incidental/Personal participants and women with no vocational credits. Thus, with respect to unionization, white women show much less variation by pattern group then do minority women. Limited Concentrators and Concentrator/Explorers show a very different pattern for white women than minority women.

These differences between men and women in the tendency to be in unionized jobs are shown subsequently to explain a significant part of the differences in earnings among respondents who take vocational education and those who do not. They also tends to help explain why women, especially minority women, are found more often than men to have earnings advantages when they take vocational education.

Size of Firm

- Though neither tendency is very strong, among men, vocational concentration is associated with less frequent employment in large firms, and among women the relationship is reversed.

The size of the firms in which people are employed is important to this study for two reasons. First, there is a tendency for the best jobs to be found in large firms (Doeringer and Piore 1971). Jobs in large firms tend to be those with more regular hours, with greater job security, with more fringe benefits, and with higher earnings. They also tend to be jobs in which work rules are more explicit, and in which job ladders for advancement are clearer and more highly formalized. Second, there may be nonpecuniary advantages to working in smaller firms (or disadvantages to working in larger firms). One is more likely to get to know fellow workers in a smaller firm. Contact between management and line employees is likely to be closer in a smaller firm, morale may be better, and hours may be more flexible. All in all, working in a small firm may be more desirable in several respects. One would expect, therefore, that earnings differentials would have to be paid to compensate people for working in larger firms.* Thus, any differences in the pattern of distribution of vocational participants and nonvocational participants among jobs in large and small firms could contribute to explaining differences that are observed in income and earnings.

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*This issue is considered in the context of differences between unionized and nonunionized firms in Duncan and Stafford (1980).

Significant differences in the distribution among vocational patterns do arise for men, but the pattern of differences is not very clear (Table 3-30). Overall, 54 percent of men work in jobs with firms of over 1,000 employees, and 46 percent work in firms that are smaller. Concentrator/Explorers and respondents with no vocational credits are more likely to be in firms with less than 1,000 employees. Incidental/Personal participants and Limited Concentrators are more likely to be in large firms.

Concentrators and Limited Concentrators also more frequently (about 50 percent of the concentrator patterns compared to 40 percent overall) work in single establishment firms. But Incidental/Personal participants, Concentrator/Explorers, and respondents with no vocational education are more likely to be in multiestablishment firms. Thus, among men, although there are clear differences among respondents with different forms of participation in vocational education, there is no overall pattern that indicates respondents with more vocational education are more or less likely to be in either large or small firms, or single or multiestablishment firms. It is unlikely, therefore, that patterns of distribution by size of firm will offer many clues to the distribution of the best jobs, or those with more fringe benefits, greater security, or higher earnings.

Women show a much clearer pattern for size of firm. Greater concentration in vocational education is associated with a higher likelihood of being in a multiestablishment firm. However, only Concentrators show a higher likelihood than the average for all respondents of being in multiestablishment firms. Limited Concentrators and Concentrator/Explorers are less likely than women with Incidental/Personal participation in vocational education to be in jobs in multiestablishment firms. It is clear however, that women with no vocational credits are statistically significantly less likely than women with any other pattern to be working in multiestablishment firms. They are also less likely to be in jobs in firms with more than 1,000 employees. Thus, although there is some tendency for greater vocational concentration to be associated with a higher likelihood of working in multiestablishment firms, the principal difference is between women with no vocational credits and all other women. This tendency is probably attributable to the requirement for large numbers of clerical workers within large firms. Overall, about 60 percent of women are in multiestablishment firms and 60 percent also are in firms with more than 1,000 employees.

One might expect from this distribution a clearer pattern to emerge for nonvocational women as being less likely to hold jobs with the most job security, the best fringe benefits, the highest earnings, the clearest promotion possibilities, and the best career opportunities. The conjectures about fringe benefits and other nonpecuniary advantages are examined more closely next.

Shift Employment

- For both men and women, higher concentration in vocational education is associated with more frequently working regular day (or evening) shifts rather than night, split, or varying shifts.

It is well known that for most workers, some shifts are more desirable than others, and that wage differentials exist to compensate for the disadvantages associated with working night or split shifts. Hence, differences in the patterns of shift work may help to explain some of the differences that are reported in hourly earnings.

In general, about 57 percent of all men and 61 percent of all women are shown in the data to have worked a regular day shift (see table 3-31). About 10 percent of both sexes worked a regular evening shift, about 5 percent worked in night shifts, and about 2 percent worked split shifts. The remainder, about 22 percent, are classified in the NLS Youth data as having worked varying shifts.* Although differences among vocational patterns in the distribution among the various shifts are not strictly significant, both men and women with greater participation in vocational education (Concentrators, Limited Concentrators, and Concentrator/Explorers) are more likely to have worked regular day shifts and less likely to have worked night, split, or varying shifts. Those respondents with no vocational credits are more likely to have worked varying shifts.

The differences between men and women show up in regular evening shifts. For that shift, male Concentrators, Limited Concentrators, and Concentrator/Explorers are slightly more likely than other vocational patterns to have worked the regular evening shifts. Women Concentrators, Limited Concentrators, and Concentrator/Explorers are less likely to have worked regular evening shifts. Among women, Incidental/Personal participants are more likely to have worked regular evening shifts. Night shifts, split shifts and varying shifts were more frequently reported by nonvocational respondents--either Incidental/Personal participants or those with no vocational credits. These results suggest that in at least one respect, more nonpecuniary benefits accrue to students with more vocational education. The benefits are attributed to working more "regular" shifts. One would expect, therefore, that the other pattern groups would receive some compensating wage differentials. Because the differences in distribution are not very pronounced, however, these differentials are likely to be small.

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*The term "varying" is not explicitly defined in the questionnaire, and the category is apparently a residual.

Fringe Benefits

- There is a weak tendency for respondents with some vocational concentration to be more likely to have paid health or life insurance or paid vacation.

Fringe benefits reflect returns from work that are not included in what is reported by respondents as earnings or pay from work; they are the residual of total compensation. In comparing the total return to employment for various workers, the comparison should be based on total compensation, not simply on earnings. Nevertheless, most of the data that are available do not report total compensation adjusted for fringe benefits. This is one of the major shortcomings of the data sets that are used to analyze labor market behavior on an individual basis.

The NLS Youth data contain some information on three categories of fringe benefits: health insurance, life insurance, and paid vacation. Little information is elicited from respondents; no computations can be made of the value of these various fringe benefits. The only information is the fact that there are differences in availability of benefits. Nevertheless, it was considered important to examine at least the differences that can be found in the data.

The differences in the availability of fringe benefits are not dramatic and are usually not significant (table 3-32). For instance, there is a slight but not significant tendency for Concentrators, Limited Concentrators, and Concentrator/Explorers (when these three categories are considered as a large group) to be more likely to have employer-paid health or life insurance. There is also a slight tendency for all vocational Concentrators to have paid vacations. The only difference that is statisically significant is that women in these groups are more likely to have paid vacations. (The distribution of fringe benefits suggests that among all three categories, for both men and women, Concentrators are more likely to be in regular jobs.) This slight tendency for vocational participants to have more fringe benefits means that reported differentials in earnings will overstate two differences in total compensation between respondents with and without vocational education. The data from the NLS Youth cannot be used to estimate how important these differences might be.

Summary

The results of these preliminary analyses give tentative support to the hypothesis that the effects of secondary vocational education operate in indirect ways. The analyses do not, however, control for the multiple influences upon the outcomes in the labor market that may be mediated by the conditions examined in this chapter. Moreover, depending upon the purpose of any

specific analysis, some of the mediating outcomes may be outcomes of primary interest in themselves. The preliminary analyses were not, however, subjected to the necessary multiple controls to allow adequately supported conclusions to be reached on matters of primary interest. Therefore, more comprehensive analyses were developed from these preliminary efforts and applied to the NLS Youth data. These analyses are discussed in the next chapter.

TABLE 3-1

NUMBER OF MONTHS OF MULTIPLE JOB HOLDING BY
VOCATIONAL EDUCATION PATTERNS
(PERCENTAGE DISTRIBUTION)

Patterns	Number of Months 0	1-3	4+	n
Concentrator				
Full Sample[1]	81.6	7.8	10.4	348
Not Enrolled[2]	82.7	5.4	11.9	168
Limited Concentrator				
Full Sample	86.2	7.5	6.4	590
Not Enrolled	88.2	5.3	6.5	263
Concentrator/Explorer				
Full Sample	85.3	9.2	5.5	361
Not Enrolled	87.0	8.0	4.9	162
Explorer				
Full Sample	83.3	13.0	3.7	54
Not Enrolled	87.5	8.3	4.2	24
Incidental/Personal				
Full Sample	84.4	8.2	7.4	1129
Not Enrolled	85.6	8.2	6.2	355
Nonvocational				
Full Sample	83.2	9.6	7.2	636
Not Enrolled	85.3	5.8	8.9	191
Incomplete Transcript				
Full Sample	89.9	5.8	4.3	1968
Not Enrolled	91.1	5.8	4.1	926
Total				
Full Sample	86.4	7.5	6.1	5086
Not Enrolled	88.3	5.8	5.9	2089

NOTE: Data shown in the table are unweighted. Percentages may not add up to 100 due to rounding.

[1]Complete sample of high school graduates.

[2]High school graduates, not enrolled since 1977.

TABLE 3-2

TOTAL NUMBER OF JOBS HELD BY
VOCATIONAL EDUCATION PATTERNS
MEN
(PERCENTAGE DISTRIBUTION)

Patterns	Number of Jobs 0	1	2	3	4+	n
Concentrator						
Full Sample [1]	0.6	34.2	40.2	21.6	3.5	124
Not Enrolled [2]	0.0	38.4	37.2	20.9	3.6	67
Limited Concentrator						
Full Sample	1.9	43.6	28.0	19.9	6.6	224
Not Enrolled	0.0	46.5	29.1	17.8	6.6	107
Concentrator/Explorer						
Full Sample	3.1	36.4	37.6	16.9	6.0	109
Not Enrolled	0.0	38.6	36.4	17.3	7.8	47
Explorer						
Full Sample	0.0	31.9	40.4	19.3	8.5	21
Not Enrolled	0.0	32.5	49.5	18.0	0.0	12
Incidental/Personal						
Full Sample	2.4	34.4	34.7	20.0	8.5	582
Not Enrolled	1.6	41.4	29.7	16.5	10.8	205
Nonvocational						
Full Sample	4.7	41.7	28.1	16.1	9.4	439
Not Enrolled	0.6	45.2	22.9	16.4	14.9*	144
Incomplete Transcript						
Full Sample	3.6	34.9	34.4	19.4	7.8	693
Not Enrolled	0.4	40.3	31.8	18.3	9.3	284
Total						
Full Sample	3.1	33.1	33.1	18.9	7.9	2193
Not Enrolled	0.6	41.8	30.4	17.6	9.6	866

NOTE: Percentages shown in the table may not add up to 100 due to rounding.

[1]Complete sample of high school graduates.

[2]High school graduates, not enrolled since 1977.

*Probability $\leq$ .05

TABLE 3-3

TOTAL NUMBER OF JOBS HELD BY
VOCATIONAL EDUCATION PATTERNS
WOMEN
(PERCENTAGE DISTRIBUTION)

Patterns	Number of Jobs 0	1	2	3	4+	n
Concentrator						
Full Sample [1]	3.8	46.7	28.1	15.5	5.9	229
Not Enrolled [2]	2.6	52.0*	20.3*	20.3	4.8	114
Limited Concentrator						
Full Sample	3.1*	40.2	33.1	16.6	7.1	360
Not Enrolled	3.1	37.5	37.5	13.1	8.9	165
Concentrator/Explorer						
Full Sample	4.4	40.2	35.6	15.0	4.8	231
Not Enrolled	4.4	36.9	34.6	18.6	5.6	107
Explorer						
Full Sample	0.0	56.1	19.0	11.1	13.8	27
Not Enrolled	0.0	48.7	16.6	12.7	22.0	8
Incidental/Personal						
Full Sample	6.3	37.1	35.5	16.2	4.8	633
Not Enrolled	2.8	34.4	42.7	17.0	3.2*	194
Nonvocational						
Full Sample	9.4*	39.4	33.7	12.3	5.2	268
Not Enrolled	6.5	37.7	33.7	12.8	9.4	72
Incomplete Transcript						
Full Sample	6.0	36.9	33.5	15.9	7.8	833
Not Enrolled	5.3	37.0	34.5	14.9	8.3	415
Total						
Full Sample	5.6	39.0	33.5	15.5	6.3	258
Not Enrolled	4.2	38.3	34.8	15.8	7.0	1076

NOTE: Percentages shown in the table may not add up to 100 due to rounding.

[1]Complete sample of high school graduates.

[2]High school graduates, not enrolled since 1977.

*Probability $\leq$ .05

TABLE 3-4

WEEKS IN THE LABOR FORCE PER YEAR BY
VOCATIONAL EDUCATION PATTERNS
FULL SAMPLE: MEN
(PERCENTAGE DISTRIBUTION)

Patterns	Weeks in the Labor Force					
	52	51-48	47-39	38-26	25-0	n
Concentrator						
1978[1]	61.2	4.5	12.6	17.8	3.9	59
1979[2]	63.4	9.6	14.5	6.7	5.8	107
Limited Concentrator						
1978	76.0	4.6	6.8	10.9	1.8*	96
1979	70.1	7.7	10.1	4.9	7.2	157
Concentrator/Explorer						
1978	68.0	8.0	9.5	12.6	1.9	41
1979	67.2	17.5*	8.3	5.7	1.3*	72
Explorer						
1978	31.4	20.3	33.3*	9.7	5.4	9
1979	73.3	10.6	2.7	11.6	1.9	18
Incidental/Personal						
1978	58.3	9.4	11.0	13.7	7.5	184
1979	62.0	10.6	10.9	10.2	6.2	313
Nonvocational						
1978	62.1	8.8	5.8	17.0	6.4	132
1979	58.7	11.9	11.9	9.1	8.4	228
Incomplete Transcript						
1978	61.7	9.4	9.5	8.5	10.9*	252
1979	58.1	8.2	13.2	9.4	11.1*	484
Total						
1978	62.7	8.4	9.4	12.4	7.1	772
1979	61.5	10.0	11.8	8.6	8.1	1380

NOTE: Percentages in the table may not add up to 100 due to rounding.

[1]Calendar year 1979.

[2]Calendar year 1980.

*Probability $\leq$ .05

TABLE 3-5

WEEKS IN THE LABOR FORCE PER YEAR BY
VOCATIONAL EDUCATION PATTERNS
EXACTLY 12 YEARS EDUCATION: MEN
(PERCENTAGE DISTRIBUTION)

Patterns	Weeks in the Labor Force					n
	52	51-48	47-39	38-26	25-0	
Concentrator						
1978[1]	64.2	4.9	10.1	16.7	4.1	56
1979[2]	61.8	9.6	15.3	7.2	6.2	102
Limited Concentrator						
1978	78.4	5.3	8.0	7.7	0.6*	83
1979	71.9	8.6	8.7	4.1	6.7	139
Concentrator/Explorer						
1978	77.6	5.1	11.0	4.1	2.2	36
1979	71.0	12.2	9.1	6.2	1.5	62
Explorer						
1978	36.1	23.3	23.4	11.1	6.2	8
1979	68.4	12.5	3.2	13.7	2.2	16
Incidental/Personal						
1978	59.3	9.7	12.9	13.2	5.0	159
1979	59.5	10.9	13.7	7.7	8.2	170
Nonvocational						
1978	59.6	9.8	5.4	18.5*	6.7	120
1979	59.5	10.9	13.7	7.7	8.2	170
Incomplete Transcript						
1978	62.9	8.9	9.2	8.7	10.4*	222
1979	62.1	8.7	10.0	8.5	10.7*	399
Total						
1978	63.9	8.5	9.6	11.8	6.3	683
1979	64.5	10.0	10.4	7.4	7.7	1127

NOTE: Percentages in the table may not add up to 100 due to rounding.

[1]Calendar year 1979.

[2]Calendar year 1980.

*Probability $\leq$ .05

TABLE 3-6

WEEKS IN THE LABOR FORCE PER YEAR BY
VOCATIONAL EDUCATION PATTERNS
FULL SAMPLE: WOMEN
(PERCENTAGE DISTRIBUTION)

Patterns	Weeks in the Labor Force 52	51-48	47-39	38-26	25-0	n
Concentrator						
1978[1]	60.4	7.0	12.6	9.9	10.5*	120
1979[2]	59.0*	6.3	9.1	7.8	17.7	171
Limited Concentrator						
1978	48.8	11.6	8.8	13.6	17.2	172
1979	44.9	13.3	8.7	7.9	25.2	280
Concentrator/Explorer						
1978	50.8	8.1	5.3	17.0	18.9	108
1979	48.1	9.0	13.3	10.0	19.6	166
Explorer						
1978	41.6	2.7	14.4	13.5	27.8	10
1979	45.1	17.1	16.5	5.5	15.7	21
Incidental/Personal						
1978	50.0	8.5	7.9	7.9*	25.8	193
1979	41.6	13.0	14.2	15.8*	15.5*	326
Nonvocational						
1978	26.8*	16.9*	11.5	23.8*	21.0	77
1979	39.3	11.5	11.1	19.8*	18.3	121
Incomplete Transcript						
1978	41.7	7.6	10.3	14.8	25.7	417
1979	40.0	10.7	12.9	11.9	24.6	631
Total						
1978	46.2	9.0	9.5	13.7	21.7	1098
1979	43.8	11.1	12.0	11.9	21.3	1716

NOTE: Percentages in the table may not add up to 100 due to rounding.

[1]Calendar year 1979.

[2]Calendar year 1980.

*Probability $\leq$ .05

TABLE 3-7

WEEKS IN THE LABOR FORCE PER YEAR BY
VOCATIONAL EDUCATION PATTERNS
EXACTLY 12 YEARS EDUCATION: WOMEN
(PERCENTAGE DISTRIBUTION)

Patterns	Weeks in the Labor Force 52	51-48	47-39	38-26	25-0	n
Concentrator						
1978[1]	63.3*	7.7	10.9	8.5	9.7*	109
1979[2]	60.9*	6.1*	10.2	6.3	16.6	148
Limited Concentrator						
1978	51.4	10.7	9.3	12.6	16.0	150
1979	45.5	15.2	6.8*	6.2*	26.3	239
Concentrator/Explorer						
1978	53.0	6.5	4.8	15.1	20.6	84
1979	45.4	10.2	13.0	9.7	21.7	128
Explorer						
1978	40.9	3.0	16.0	9.2	30.9	9
1979	33.1	27.2	10.1	8.7	20.9	13
Incidental/Personal						
1978	44.4	10.4	8.5	7.2	29.5	149
1979	39.1	12.2	13.7	18.7*	16.3*	222
Nonvocational						
1978	26.3	7.8	8.1	17.7	30.2	49
1979	39.7	14.9	6.1	15.2	24.1	72
Incomplete Transcript						
1978	42.1	7.6	9.7	13.4	27.3	337
1979	37.6	10.6	12.9	10.4	28.5*	476
Total						
1978	47.4	8.4	9.1	12.0	23.2	887
1979	42.8	11.6	11.2	10.8	23.7	1297

NOTE: Percentages in the table may not add up to 100 due to rounding.

[1]Calendar year 1979.

[2]Calendar year 1980.

*Probability $\leq$ .05

TABLE 3-8

WEEKS WORKED PER YEAR BY
VOCATIONAL EDUCATION PATTERNS
FULL SAMPLE: MEN
(PERCENTAGE DISTRIBUTION)

Patterns	Weeks Worked 0	1-4	5-13	14-26	27-52	n
Concentrator						
1978[1]	0.5	0.7	0.4	8.0	90.5	64
1979[2]	0.2	0.8	1.6	9.1	88.3	110
Limited Concentrator						
1978	1.6	1.5	1.6	4.8	90.5	104
1979	1.0	0.0	5.0	9.0	85.0	160
Concentrator/Explorer						
1978	0.0	0.0	0.7	2.7	96.7	42
1979	4.2	0.0	2.4	1.4*	92.0	78
Explorer						
1978	4.3	0.0	2.1	19.9	73.7	11
1979	0.0	0.0	3.1	5.8	91.1	18
Incidental/Personal						
1978	1.3	1.3	1.2	8.9	87.3	206
1979	2.9	0.9	2.6	6.6	87.1	334
Nonvocational						
1978	1.5	0.0	3.8	11.4	83.3	151
1979	1.6	0.3	2.1	9.2	86.8	232
Incomplete Transcript						
1978	4.0*	2.2	4.1	11.0	78.7	282
1979	4.2*	1.4	4.2	10.7	79.5	508
Total						
1978	2.2	1.3	2.6	9.3	84.7	860
1979	2.8	0.8	3.3	8.6	84.5	1440

NOTE: Percentages in the table may not add up to 100 due to rounding.

[1]Calendar year 1979.

[2]Calendar year 1980.

*Probability $\leq$ .05

TABLE 3-9

WEEKS WORKED PER YEAR BY
VOCATIONAL EDUCATION PATTERNS
EXACTLY 12 YEARS EDUCATION: MEN
(PERCENTAGE DISTRIBUTION)

Patterns	Weeks Worked 0	1-4	5-13	14-26	27-52	n
Concentrator						
1978[1]	0.5	0.7	0.4	8.5	89.9	61
1979[2]	0.3	0.8	1.8	9.7	87.5	102
Limited Concentrator						
1978	1.1	1.8	0.6	4.4	92.1	90
1979	1.1	0.0	5.5	8.3	85.0	138
Concentrator/Explorer						
1978	0.0	0.0	0.8	3.1	96.1	37
1979	1.3	0.0	2.9	1.7	94.2	65
Explorer						
1978	5.9	0.0	2.9	2.9	88.3	8
1979	0.0	0.0	3.6	6.8	89.5	15
Incidental/Personal						
1978	1.4	1.4	1.3	7.0	88.9	175
1979	3.0	1.2	3.1	5.0	87.7	252
Nonvocational						
1978	1.1	0.0	4.1	12.3	82.5	136
1979	2.2	0.4	2.8	6.9	87.7	170
Incomplete Transcript						
1978	3.3	2.5	4.5	11.0	78.8	252
1979	5.0*	1.3	5.2	9.5	79.1	405
Total						
1978	1.9	1.4	2.7	8.8	85.2	760
1979	3.0	0.8	4.0	7.5	84.7	1148

NOTE: Percentages in the table may not add up to 100 due to rounding.

[1]Calendar year 1979.

[2]Calendar year 1980.

*Probability $\leq$ .05

TABLE 3-10

WEEKS WORKED PER YEAR BY
VOCATIONAL EDUCATION PATTERNS
FULL SAMPLE: WOMEN
(PERCENTAGE DISTRIBUTION)

Patterns	Weeks Worked 0	1-4	5-13	14-26	27-52	n
Concentrator						
1978[1]	7.0	0.0	4.6	2.9*	85.6	128
1979[2]	5.2*	1.5	2.2	15.1	76.0	179
Limited Concentrator						
1978	9.7	1.1	6.7	9.1	73.3	192
1979	12.2	2.1	5.7	9.7	70.3	289
Concentrator/Explorer						
1978	13.1	0.0	6.6	12.7	67.6	123
1979	10.9	2.1	4.9	7.5	74.7	174
Explorer						
1978	8.3	0.0	10.5	22.6	58.6	11
1979	6.0	0.0	14.3	6.5	73.3	21
Incidental/Personal						
1978	13.1	1.0	2.5*	12.9	70.6	215
1979	7.4*	0.9	3.3*	13.6*	74.8	350
Nonvocational						
1978	10.1	0.4	11.9	13.4	64.1	92
1979	8.1	0.3	12.5*	9.4	69.7	128
Incomplete Transcript						
1978	13.8	2.7*	9.2	11.5	62.7	477
1979	14.3*	1.2	7.4	11.1	66.0	670
Total						
1978	12.0	1.4	7.2	10.9	68.6	1238
1979	10.9	1.3	6.0	11.2	70.6	1810

NOTE: Percentages in the table may not add up to 100 due to rounding.

[1]Calendar year 1979.

[2]Calendar year 1980.

*Probability $\leq$ .05

TABLE 3-11

WEEKS WORKED PER YEAR BY
VOCATIONAL EDUCATION PATTERNS
EXACTLY 12 YEARS EDUCATION: WOMEN
(PERCENTAGE DISTRIBUTION)

Patterns	Weeks Worked 0	1-4	5-13	14-26	27-52	n
Concentrator						
1978[1]	6.2*	0.0	5.1	3.1*	85.7*	115
1979[2]	4.9*	0.6	2.5*	14.8	77.3	156
Limited Concentrator						
1978	9.3	0.4	6.2	8.8	75.3	167
1979	12.0	2.5	2.7	8.7	70.2*	246
Concentrator/Explorer						
1978	13.7	0.0	8.2	11.9	66.2	96
1979	11.1	2.5	5.8	6.9	73.8	135
Explorer						
1978	4.5	0.0	12.2	26.2	57.0	10
1979	9.5	0.0	18.5	10.3	61.7	13
Incidental/Personal						
1978	15.9	1.1	2.8*	13.8	66.4	167
1979	9.3	0.4	3.1*	15.1	72.0	237
Nonvocational						
1978	12.5	0.7	16.2*	13.9	56.8	60
1979	13.1	0.5	15.1*	11.0	60.3	79
Incomplete Transcript						
1978	16.1	3.3*	8.7	11.0	60.9	386
1979	17.0*	1.0	7.8	13.1	61.1	510
Total						
1978	13.2	1.6	7.3	10.6	67.3	1001
1979	12.5	1.2	6.5	12.1	67.7	1376

NOTE: Percentages in the table may not add up to 100 due to rounding.

[1]Calendar year 1979.

[2]Calendar year 1980.

*Probability $\leq$ .05

TABLE 3-12

WEEKS UNEMPLOYED PER YEAR BY VOCATIONAL EDUCATION PATTERNS
FULL SAMPLE: MEN
(PERCENTAGE DISTRIBUTION)

Patterns	Weeks Unemployed 0	1-4	5-13	14-26	27-52	n
Concentrator						
1978[1]	66.1	13.1	15.4	5.4	0.0	59
1979[2]	78.7	4.3*	7.4	9.3	0.3	107
Limited Concentrator						
1978	73.3	5.4	14.4	4.6	2.3	96
1979	67.8	6.6	15.4	5.2	5.0	157
Concentrator/Explorer						
1978	80.1	12.9	6.5	0.5	0.0	41
1979	70.6	7.9	9.9	4.9	6.7	72
Explorer						
1978	60.8	25.2	14.1	0.0	0.0	9
1979	57.5	9.0	15.1	16.9	1.5	18
Incidental/Personal						
1978	63.5	15.0	14.6	5.4	1.6	184
1979	66.8	9.1	14.7	6.8	2.5	313
Nonvocational						
1978	59.4	12.1	20.2	6.3	2.1	132
1979	66.5	14.5	12.1	5.2	1.8	228
Incomplete Transcript						
1978	66.2	11.9	11.4	6.7	3.8	252
1979	58.4	12.9	16.7	9.0	3.0	484
Total						
1978	66.0	12.1	14.1	5.6	2.3	772
1979	64.9	10.6	14.2	7.4	2.9	1380

NOTE: Percentages in the table may not add up to 100 due to rounding.

[1]Calendar year 1979.

[2]Calendar year 1980.

*Probability $\leq$ .05

TABLE 3-13

WEEKS UNEMPLOYED PER YEAR BY VOCATIONAL EDUCATION PATTERNS
EXACTLY 12 YEARS EDUCATION: MEN
(PERCENTAGE DISTRIBUTION)

Patterns	Weeks Unemployed					
	0	1-4	5-13	14-26	27-52	n
Concentrator						
1978[1]	65.4	12.4	16.5	5.8	0.0	56
1979[2]	81.5*	3.7	7.2	7.4	0.3	102
Limited Concentrator						
1978	70.3	5.7	15.9	5.4	2.7	83
1979	66.6	4.9	17.6	6.0	5.0	139
Concentrator/Explorer						
1978	81.5	10.4	7.5	0.6	0.0	36
1979	74.3	5.4	10.5	5.8	3.9	62
Explorer						
1978	54.9	28.9	16.1	0.0	0.0	8
1979	49.9	10.6	17.8	19.9	1.7	16
Incidental/Personal						
1978	64.0	13.2	14.9	6.1	1.9	159
1979	69.6	8.2	11.3	7.8	3.2	239
Nonvocational						
1978	61.1	13.4	18.9	5.3	1.2	120
1979	69.3	12.6	11.0	6.1	1.1	170
Incomplete Transcript						
1978	65.5	12.4	12.1	5.9	4.1	222
1979	57.2*	12.2	16.6	10.5	3.6	399
Total						
1978	65.6	12.0	14.5	5.5	2.3	683
1979	65.8	9.4	13.6	8.3	3.0	1127

NOTE: Percentages in the table may not add up to 100 due to rounding.

[1]Calendar year 1979.

[2]Calendar year 1980.

*Probability $\leq$ .05

TABLE 3-14

WEEKS UNEMPLOYED PER YEAR BY VOCATIONAL EDUCATION PATTERNS
FULL SAMPLE: WOMEN
(PERCENTAGE DISTRIBUTION)

Patterns	Weeks Unemployed 0	1-4	5-13	14-26	27-52	n
Concentrator						
1978[1]	68.4	11.3	14.8	3.3	2.3	120
1979[2]	69.0	11.5	16.5	2.8	0.2*	171
Limited Concentrator						
1978	63.9	13.2	17.0	3.2	2.7	172
1979	69.9	10.5	15.2	3.7	0.6*	280
Concentrator/Explorer						
1978	61.2	19.7	12.4	4.3	2.5	108
1979	64.8	11.2	17.2	5.7	1.0	166
Explorer						
1978	77.7	2.2	7.0	8.3	4.9	10
1979	62.7	10.4	15.9	2.4	8.6	21
Incidental/Personal						
1978	65.8	14.1	13.7	5.6	0.8	193
1979	62.0	15.3	13.0	7.7	2.1	326
Nonvocational						
1978	48.3	22.7	15.1	0.4	3.6	77
1979	58.2	14.2	18.1	5.8	3.8	121
Incomplete Transcript						
1978	56.8	19.8	14.1	6.4	2.9	417
1979	63.3	14.3	13.0	5.0	4.6*	631
Total						
1978	60.8	16.9	14.4	5.5	2.5	1098
1979	64.5	13.2	14.5	5.2	2.7	1716

NOTE: Percentages in the table may not add up to 100 due to rounding.

[1]Calendar year 1979.

[2]Calendar year 1980.

*Probability $\leq$ .05

TABLE 3-15

WEEKS UNEMPLOYED PER YEAR BY VOCATIONAL EDUCATION PATTERNS
EXACTLY 12 YEARS EDUCATION: WOMEN
(PERCENTAGE DISTRIBUTION)

Patterns	Weeks Unemployed 0	1-4	5-13	14-26	27-52	n
Concentrator						
1978[1]	70.0	12.1	11.6	3.6	2.6	109
1979[2]	69.4	12.3	14.8	3.3	0.2	148
Limited Concentrator						
1978	66.5	12.6	17.8	1.9*	1.3	150
1979	69.0	11.2	15.4	3.7	0.8*	239
Concentrator/Explorer						
1978	59.8	18.0	13.5	5.5	3.2	84
1979	65.2	13.5	14.6	6.0	0.8	128
Explorer						
1978	80.6	2.5	7.8	9.2	0.0	9
1979	49.5	12.3	20.7	3.8	13.7*	13
Incidental/Personal						
1978	64.5	11.5	16.0	6.9	1.1	149
1979	57.9	15.7	16.5	9.0*	0.9	222
Nonvocational						
1978	53.4	16.4	10.5	16.5*	3.2	49
1979	54.1	16.9	13.6	9.1	6.4	72
Incomplete Transcript						
1978	59.1	18.4	13.4	6.8	2.3	337
1979	61.7	15.1	12.7	5.0	5.5*	476
Total						
1978	62.6	15.2	14.1	6.1	2.1	887
1979	63.1	14.1	14.4	5.5	2.9	1297

NOTE: Percentages in the table may not add up to 100 due to rounding.

[1]Calendar year 1979.

[2]Calendar year 1980.

*Probability $\leq$ .05

TABLE 3-16

MONTHS OF TENURE ON MOST RECENT JOB BY VOCATIONAL EDUCATION PATTERNS

MEN

	Patterns						
	1	2	3	4	5	6	7
White Males							
Full Sample							
Mean	18.2	17.3	20.2	37.6	15.5	14.9	11.3
Median	13	11	14	14	9	10	5
n	69	89	43	15	181	113	319
12 Years Education							
Mean	17.2	17.5	21.1	41.5	17.6	15.7	11.1
Median	13	11	15	14	13	10	6
n	66	79	35	13	139	85	264
Not Enrolled Since 1977							
Mean	23.4	20.6	22.0	31.4	19.4	16.8	13.1
Median	16	26	20	15.5	16	12	7
n	43	64	27	8	115	76	203
Minority Males							
Full Sample							
Mean	15.6	15.7	12.7	18.4	11.8	12.2	11.8
Median	8.5	12	8	9	7	7	6
n	34	43	29	5	72	56	196
12 Years Education							
Mean	15.2	15.3	13.4	18.4	12.5	12.4	11.9
Median	8	11	8	9	7	6	6
n	27	38	26	5	49	45	163
Not Enrolled Since 1977							
Mean	20.3	17.2	16.0	5.5	15.7	15.7	14.3
Median	13.5	12	10.5	5.5	10	9	9
n	20	33	14	4	39	33	107

1 = Concentrator
2 = Limited Concentrator
3 = Concentrator/Explorer
4 = Explorer
5 = Incidental/Personal
6 = Nonvocational
7 = Incomplete Transcript

TABLE 3-17

MONTHS OF TENURE ON MOST RECENT JOB BY VOCATIONAL EDUCATION PATTERNS

WOMEN

	Patterns						
	1	2	3	4	5	6	7
White Females							
Full Sample							
Mean	16.2	12.6	11.9	12.3	12.3	9.7	10.7
Median	9	9	9	7	8	7	7
n	92	131	80	9	162	61	311
12 Years Education							
Mean	17.0	13.2	11.7	12.3	11.9	11.7	10.8
Median	9	9	9	4	8	9.5	6.5
n	79	111	61	7	104	26	234
Not Enrolled Since 1977							
Mean	19.9	14.7	14.0	15	14.5	12.6	11.8
Median	15	11	11	11	11	12	8
n	62	87	56	5	102	31	224
Minority Females							
Full Sample							
Mean	12.3	9.4	11.2	8.4	14.2	14.9	10.3
Median	5.5	5	6.5	4	8	11	7
n	26	64	50	8	64	29	196
12 Years Education							
Mean	13.3	9.9	12.0	8.8	16.1	14.5	11.0
Median	6	6	8	4	8	11	7
n	23	47	38	5	46	21	144
Not Enrolled Since 1977							
Mean	15.9	13.3	14.0	5.8	21.0	17.3	12.3
Median	12.5	10	10	4	13	11.5	8
n	18	33	29	5	31	18	133

1 = Concentrator
2 = Limited Concentrator
3 = Concentrator/Explorer
4 = Explorer
5 = Incidental/Personal
6 = Nonvocational
7 = Incomplete Transcript

TABLE 3-18

MONTHS OF LABOR MARKET EXPERIENCE BY VOCATIONAL EDUCATION PATTERNS

MEN

	Patterns						
	1	2	3	4	5	6	7
White Males							
Full Sample							
Mean	16.6	20.2	17.5	16.4	12.1	18.0	17.4
Median	11.8	14.5	12.2	12.2	13.0	13.6	13.2
n	71	89	43	15	182	113	321
12 Years Education							
Mean	16.7	19.4	16.1	16.4	18.5	16.8	16.2
Median	11.7	12.5	11.5	12	12.3	12	12.2
n	68	79	35	13	140	85	266
Not Enrolled Since 1977							
Mean	20.4	23.0	19.2	20.1	21.5	19.5	19.0
Median	13.8	18.8	15	18.1	17.5	15.9	14.3
n	44	64	28	8	116	76	205
Minority Males							
Full Sample							
Mean	13.2	19.0	14.0	5.7	16.3	15.9	16.5
Median	10.8	15.7	11.1	3.2	12.7	12.7	12.5
n	34	43	29	5	71	56	193
12 Years Education							
Mean	11.5	18.5	13.6	5.7	15.9	15.0	16.2
Median	10.4	14.4	10.6	3.2	11.1	12	12.2
n	27	38	26	5	49	45	161
Not Enrolled Since 1977							
Mean	17.0	21.5	16.9	4.2	19.7	17.7	19.6
Median	12.5	21.9	12	2.9	14.3	14.1	17.3
n	20	33	14	4	39	33	105

1 = Concentrator
2 = Limited Concentrator
3 = Concentrator/Explorer
4 = Explorer
5 = Incidental/Personal
6 = Nonvocational
7 = Incomplete Transcript

TABLE 3-19

MONTHS OF LABOR MARKET EXPERIENCE BY VOCATIONAL EDUCATION PATTERNS

WOMEN

	Patterns						
	1	2	3	4	5	6	7
White Females							
Full Sample							
Mean	17.2	17.2	17.1	18.7	17.2	17.4	16.8
Median	12.5	11.8	12.6	11.1	12.5	16.2	12.2
n	92	130	80	9	161	62	311
12 Years Education							
Mean	16.9	16.3	15.1	13.5	14.4	14.7	16.1
Median	11.8	11.5	12	9	11.8	11.8	11.8
n	79	110	61	7	103	27	234
Not Enrolled Since 1977							
Mean	19.8	19.8	17.5	20.8	18.9	17.8	18.2
Median	15.9	14.3	13.2	18.2	14.3	16.2	14.0
n	62	86	56	5	101	32	224
Minority Females							
Full Sample							
Mean	13.8	14.2	13.7	15.1	15.4	16.4	15.3
Median	11.4	11.0	11.3	14.5	12.5	12.9	11.8
n	26	64	49	8	64	29	195
12 Years Education							
Mean	13.7	13.2	12.7	13.8	15.7	14.9	14.3
Median	11.5	9.9	11.4	13.6	12.5	11.3	11.1
n	23	47	38	5	46	21	145
Not Enrolled Since 1977							
Mean	15.7	17.6	14.6	15.7	19.5	18.4	17.7
Median	12	12	12	15.5	16.4	14.3	12.7
n	18	33	29	5	31	18	133

1 = Concentrator
2 = Limited Concentrator
3 = Concentrator/Explorer
4 = Explorer
5 = Incidental/Personal
6 = Nonvocational
7 = Incomplete Transcript

TABLE 3-20
REASON FOR JOB SEPARATION BY VOCATIONAL EDUCATION PATTERNS
MEN
(PERCENTAGE DISTRIBUTION)

Reason for Separation	Patterns 1	2	3	4	5	6	7	Total
Full Sample								
1979 Interview								
Involuntary	31.3	27.2	24.4	35.7	22.0	18.4	23.6	22.9
Hardship	5.0	3.7	3.9	0.0	2.7	4.8	4.4	3.9
Voluntary	48.8	39.0	57.7*	14.3	31.7	31.4	37.8	36.0
Other	15.0*	30.2	14.1*	50.0	43.6*	45.3*	34.2	37.3
n	80	136	78	14	486	331	453	1578
1980 Interview								
Involuntary	24.4	30.5	66.9*	26.1	31.7	27.9	27.9*	32.1
Hardship	5.6	3.5	1.1*	0.0	3.0	4.7	5.2	4.0
Voluntary	70.0	66.0	32.0*	73.9	65.3	67.4	66.9	63.9
n	90	200	181	23	530	491	695	2210
Not Enrolled Since 1977								
1979 Interview								
Involuntary	34.2*	23.9	19.2	30.8	23.8	19.4	20.9	22.5
Hardship	5.1	4.2	4.1	0.0	3.4	5.1	4.4	4.2
Voluntary	51.9	41.6	63.0*	15.4	30.2*	36.2	41.9	38.4
Other	8.9*	30.3	13.7*	53.9	42.6*	39.4	32.8	34.9
n	79	142	73	13	470	315	454	1546
1980 Interview								
Involuntary	34.2	23.4	47.8	33.3	28.4	28.5	30.0	29.5
Hardship	5.3	5.2	0.0	0.0	8.2	13.8*	6.7	7.7
Voluntary	60.5	71.4	52.2	66.7	63.4	57.7	63.3	62.8
n	38	77	23	12	134	123	240	647

NOTE: The n's in the table represent the incidences of job separation rather than the number of respondents.

1 = Concentrator
2 = Limited Concentrator
3 = Concentrator/Explorer
4 = Explorer
5 = Incidental/Personal
6 = Nonvocational
7 = Incomplete Transcript

*Probability $\leq$ .05

TABLE 3-21
REASON FOR JOB SEPARATION BY VOCATIONAL EDUCATION PATTERNS
WOMEN
(PERCENTAGE DISTRIBUTION)

Reason for Separation	Patterns 1	2	3	4	5	6	7	Total
Full Sample								
1979 Interview								
Involuntary	21.5	19.8	25.8	27.3	19.7	30.1*	23.4	23.0
Hardship	3.2	2.0	2.7	0.0	3.9	1.2	4.6	3.4
Voluntary	45.6*	44.7*	25.3*	45.5	32.6	21.3*	34.2	33.8
Other	29.8*	33.6	46.2	27.3	43.8	47.4	37.8	39.8
n	158	253	186	22	482	249	736	2086
1980 Interview								
Involuntary	26.8	21.2	24.7	42.1	26.3	31.3	24.6	25.7
Hardship	1.0*	4.2	2.1	5.3	4.4	1.5*	5.6	4.0
Voluntary	72.2	74.7	73.2	52.6	69.2	67.2	69.9	70.3
n	194	288	194	19	653	268	774	2390
Not Enrolled Since 1977								
1979 Interview								
Involuntary	22.8	20.0	24.7	33.3	18.1	31.0*	22.9	22.7
Hardship	3.7	2.4	3.3	0.0	3.2	1.4	4.8	3.5
Voluntary	47.1*	44.8*	28.7	33.3	32.3	22.4*	35.5	34.6
Other	26.5*	32.9	43.3	33.3	46.4*	45.2	36.8	39.3
n	136	210	150	18	403	210	625	1752
1980 Interview								
Involuntary	21.1	16.0	18.1	0.0	14.0	24.5	18.4	17.8
Hardship	0.0*	8.5	0.0*	33.3	10.5	7.6	7.0	6.8
Voluntary	79.0	75.5	81.9	66.7	75.5	67.9	74.6	75.4
n	57	106	72	3	143	53	331	765

NOTE: The n's in the table represent the incidences of job separation rather than the number of respondents.

1 = Concentrator
2 = Limited Concentrator
3 = Concentrator/Explorer
4 = Explorer
5 = Incidental/Personal
6 = Nonvocational
7 = Incomplete Transcript

*Probability $\leq$ .05

TABLE 3-22

OCCUPATION OF MOST RECENT JOB BY SEX AND VOCATIONAL EDUCATION PATTERNS
(PERCENTAGE DISTRIBUTION)

Occupation	Patterns 1	2	3	4	5	6	7	Total
Professional and Technical								
Women	2.3*	4.8	3.9	0.0	7.4	19.8*	7.3	7.3
Men	5.7	7.6	0.9*	5.1	9.1	10.2	8.3	8.2
Management								
Women	4.5	3.4	4.4	0.0	4.1	3.6	2.5	3.5
Men	6.6	4.0	3.2	0.0	5.4	5.0	4.9	4.9
Sales								
Women	5.4	6.6	10.7	9.9	6.5	10.9*	6.2	7.2
Men	5.5	4.9	5.0	9.7	5.0	7.2*	3.1*	4.9
Clerical								
Women	60.8*	53.3*	38.9	33.5	40.0	36.8	41.2	43.7
Men	6.8	10.5	17.3	0.0	11.9	13.7	10.2	11.4
Crafts								
Women	0.0	0.3	3.1*	0.0	0.4	0.0	2.1*	1.1
Men	32.5*	24.3	24.7	9.7	15.9	14.8	19.7	19.2
Operatives								
Women	10.0	6.3	13.6	28.7	6.8	4.6*	12.1*	9.4
Men	17.5	20.9	19.1	40.2	21.0	21.6	21.7	21.2
Laborer								
Women	1.7	2.9	0.9	0.0	2.7	0.1	1.8	1.9
Men	12.3*	15.4	14.6	3.8	14.6	11.0	14.7	13.8
Farm								
Women	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0
Men	3.1	0.8	0.0	0.0	0.1	0.0	0.5	0.4
Farm Labor								
Women	0.9	0.6	0.8	0.0	0.0	0.0	0.3	0.3
Men	3.7	1.8	2.9	5.3	2.0	0.9	1.6	1.8
Service								
Women	14.1*	21.0	23.7	28.0	30.1*	23.2	23.7	24.0
Men	6.4*	9.6	12.3	26.3	15.2	15.6	14.8	14.0

TABLE 3-22
(Continued)

Occupation	Patterns 1	2	3	4	5	6	7	Total
Household Service								
Women	0.3	0.8	0.3	0.0	2.0	1.1	2.9*	1.7
Men	0.0	0.0	0.0	0.0	0.0	0.0	0.4*	0.1
n								
Women	195	307	193	26	520	207	688	2136
Men	115	200	99	19	508	368	614	1923

NOTE: Percentages in the table may not add up to 100 due to rounding.

1 = Concentrator
2 = Limited Concentrator
3 = Concentrator/Explorer
4 = Explorer
5 = Incidental/Personal
6 = Nonvocational
7 = Incomplete Transcript

*Probability $\leq$ .05

TABLE 3-23

INDUSTRY OF MOST RECENT JOB BY SEX AND VOCATIONAL EDUCATION PATTERNS
(PERCENTAGE DISTRIBUTION)

Industry	Patterns 1	2	3	4	5	6	7	Total
Agriculture								
Women	1.4	1.5	0.8	0.0	0.1	0.8	0.7	0.7
Men	11.5*	4.0	5.2	6.3	3.3	2.2	3.0	3.7
Mining								
Women	0.0	0.6	0.0	0.0	0.0	0.0	0.6	0.3
Men	1.9	2.1	4.8*	0.0	0.8	0.4	1.2	1.3
Construction								
Women	2.1	2.5*	0.5	7.7*	0.3	1.2	0.8	1.1
Men	9.6	15.0	13.5*	17.6	11.7	5.4*	9.2	10.0
Manufacturing								
Women	14.8	10.8	17.7	30.7	10.4	11.0	15.3	13.4
Men	26.2	23.1	14.1	31.5	20.0	25.3	25.1	23.2
Transportation								
Women	4.0	1.8	0.3*	8.2	3.2	3.2	2.1	2.5
Men	6.9	5.0	1.2	8.0	6.2	4.0	5.1	5.1
Trade								
Women	32.1	34.0	39.9	17.4	40.7*	31.4	31.5	34.7
Men	29.6	24.9	37.5	32.1	28.9	34.2	26.5	29.3
Finance								
Women	11.0	12.1	11.0	4.2	8.8	3.5*	8.6	9.0
Men	1.9	2.1	2.1	0.0	2.2	3.3	2.7	2.5
Business and Repair Service								
Women	2.9	3.6	3.7	0.0	3.5	2.6	3.0	3.2
Men	5.5	10.2	11.7	1.0	7.2	4.7*	8.6	7.6
Personal Service								
Women	2.5	3.9	1.8	0.0	5.8	4.5	6.5	4.9
Men	0.8	1.2	0.0	0.0	2.4	1.4	3.3	2.1*
Entertainment								
Women	0.0	1.0	0.2	0.0	2.9*	1.4	0.6	1.2
Men	0.0	3.8	2.4	0.0	2.5	3.4	2.3	2.6

TABLE 3-23
(Continued)

Industry	Patterns 1	2	3	4	5	6	7	Total
Professional Service								
Women	24.0	24.9	22.4	31.8	23.1	37.1*	26.5	25.9
Men	6.0	8.4	4.0	2.3	10.5	12.4	11.0	10.1
Public Administration								
Women	5.2	3.6	1.6	0.0	1.3*	3.2	3.9	3.0
Men	0.3	0.3*	3.6	1.3	4.5*	3.3	2.0	2.7
n								
Women	195	307	193	26	520	205	686	2133
Men	115	202	99	19	508	370	614	1927

NOTE: Percentages in the table may not add up to 100 due to rounding.

1 = Concentrator
2 = Limited Concentrator
3 = Concentrator/Explorer
4 = Explorer
5 = Incidental/Personal
6 = Nonvocational
7 = Incomplete Transcript

*Probability $\leq$ .05

TABLE 3-24

JOB CONTENT OF MOST RECENT JOB BY SEX AND VOCATIONAL EDUCATION PATTERNS
(PERCENTAGE DISTRIBUTION)

Content Level	Patterns 1	2	3	4	5	6	7	Total
1 = High								
Women	1.3	3.1	3.0	0.0	5.0	7.8*	3.4	3.9
Men	1.3	0.4	0.6	2.3	3.6	3.7	4.0	3.1
2								
Women	1.8*	3.9	5.1	0.0	4.6	11.5*	5.9	5.3
Men	13.0	10.3*	9.7	0.0	11.5	13.4	8.8	10.7
3								
Women	61.5*	55.0*	38.3	28.7	36.8	36.2	40.7	42.9
Men	40.4	45.3*	36.5	13.8	30.5	29.2	38.9	35.2
4								
Women	20.9*	24.7	31.9	53.1*	29.1	27.5	31.1	28.8
Men	19.7	15.2	25.3	47.3*	17.8	19.6	15.0	17.8
5 = Low								
Women	14.5	13.3*	21.7	18.3	24.1	17.1	18.9	19.1
Men	25.5	28.9	27.9	36.6	31.6	34.2	33.3	33.2
n								
Women	192	302	189	26	515	207	667	2098
Men	115	195	96	19	498	356	601	1880

NOTE: Percentages in the table may not add up to 100 due to rounding.

1 = Concentrator
2 = Limited Concentrator
3 = Concentrator/Explorer
4 = Explorer
5 = Incidental/Personal
6 = Nonvocational
7 = Incomplete Transcript

*Probability $\leq$ .05

TABLE 3-25

JOB FAMILY OF MOST RECENT JOB BY SEX AND VOCATIONAL EDUCATION PATTERNS
(PERCENTAGE DISTRIBUTION)

Job Family	Patterns 1	2	3	4	5	6	7	Total
Tools, Specialized								
Women	1.5	0.1	1.9	0.0	0.7	0.3	2.1*	1.2
Men	4.3	4.6	2.0	2.3	4.7	2.8	3.4	3.7
Tools, Nonspecialized								
Women	1.7	329	1.4	2.0	3.1	0.1*	2.4	2.2
Men	37.1	36.0	39.6	5.5	27.1	22.9*	33.0	30.1
Machine and Equipment, Specialized								
Women	0.9	2.1	3.7	20.0*	1.1*	0.8	4.1*	2.6
Men	3.2	3.8	4.7	18.3	4.3	4.1	4.2	4.3
Machine and Equipment, Nonspecialized								
Women	5.6	1.8*	9.6*	8.6	4.4	1.9	5.5	4.8
Men	10.0	6.2	7.8	17.0	8.9	11.1	9.3	9.3
Inspection								
Women	1.4	0.3	1.0	0.0	0.7	2.3	1.6	1.2
Men	1.7	7.2*	0.3	1.3	4.7	2.6	4.3	4.0
Vehicle								
Women	0.0	0.3	0.0	0.0	0.5	0.4	0.4	0.3
Men	6.8	9.0	8.0	11.5	6.0	8.5	7.7	7.5
Farm								
Women	1.0	1.2	0.8	0.0	0.1	0.0	0.6	0.6
Men	6.8*	2.7	3.0	5.3	2.2	1.6	2.1	2.4
Sales, Product Knowledge Required								
Women	1.5	1.4	4.4*	0.0	1.6	1.5	1.3	1.7
Men	4.0	2.8	3.5	0.0	3.4	6.7*	3.3	3.9
Sales, No Product Knowledge Required								
Women	5.5	6.2	9.9	9.9	6.5	10.9*	6.0	7.0
Men	5.5	5.1	5.2	9.7	5.2	6.9	2.8	4.8*
Clerical								
Women	61.5*	54.7*	38.3	33.5	40.5	37.0	40.5	43.8
Men	3.9	9.1	16.3*	0.0	9.2	10.2	9.1	9.3

TABLE 3-25
(Continued)

Job Family	Patterns 1	2	3	4	5	6	7	Total
Personal Service								
Women	9.6*	13.4	14.9	9.6	23.9*	15.7	19.2	17.8
Men	4.4	5.3	5.3	26.3*	9.5	8.9	8.1	8.2
Entertainment								
Women	0.9	0.8	0.7	0.0	1.8	3.9*	0.9	1.4
Men	0.0	2.8	0.0	2.8	3.0	2.1	1.7	2.0
Protection								
Women	0.0	0.6	1.2	0.0	0.1	0.0	0.2	0.3
Men	0.0	0.9	1.8	0.0	2.3	1.8	2.4	1.9
Education								
Women	0.9	1.5	1.2	0.0	2.6	3.1	2.1	2.0
Men	0.0	0.0	0.6	0.0	1.4	1.2	1.0	0.9
Health								
Women	4.1*	8.7	7.7	9.1	7.1	13.4*	9.0	8.4
Men	3.6*	0.0	0.0	0.0	1.3	2.0	1.5	1.4
Welfare								
Women	0.0	0.9	0.4	7.3*	1.5	1.9	0.5	1.0
Men	0.0	0.3	0.0	0.0	0.2	0.8	0.2	0.3
Administration								
Women	3.8	2.8	2.1	0.0	3.3	4.1	2.6	3.0
Men	5.3	3.2	1.6	0.0	4.0	2.5	3.9	3.5
Research								
Women	0.0	0.5	0.9	0.0	0.6	2.9*	1.1	0.9
Men	3.6	1.1	0.3	0.0	3.0	3.5	2.1	2.5
n								
Women	192	302	189	26	515	207	667	2098
Men	115	195	96	19	498	356	601	1880

NOTE: Percentages in the table may not add up to 100 due to rounding.

1 = Concentrator
2 = Limited Concentrator
3 = Concentrator/Explorer
4 = Explorer
5 = Incidental/Personal
6 = Nonvocational
7 = Incomplete Transcript

*Probability $\leq$ .05

TABLE 3-26

CLASS OF EMPLOYMENT OF MOST RECENT JOB BY
SEX AND VOCATIONAL EDUCATION PATTERNS
(PERCENTAGE DISTRIBUTION)

Class of Employment	Patterns 1	2	3	4	5	6	7	Total
Private								
Women	80.8	83.0	89.8	86.1	85.9	82.7	83.5	84.3
Men	88.3	88.9	91.3	87.7	84.6	89.0	86.1	87.0
Government								
Women	18.0	16.1	9.0	13.9	12.5	14.7	14.9	14.2
Men	2.7	6.5	8.3	11.0	11.9	10.4	9.9	9.7
Self-employed								
Women	0.3	0.8	1.2	0.0	1.0	2.6	1.2	1.1
Men	9.0	3.4	0.0	1.3	3.5	0.6	3.7	3.1
Family Business								
Women	0.9	0.0	0.1	0.0	0.6	0.0	0.5	0.4
Men	0.0	1.1	0.3	0.0	0.0	0.0	0.4	0.3
n								
Women	196	308	198	26	521	207	691	2146
Men	117	203	100	19	511	372	618	1940

NOTE: Percentages in the table may not add up to 100 due to rounding.

1 = Concentrator
2 = Limited Concentrator
3 = Concentrator/Explorer
4 = Explorer
5 = Incidental/Personal
6 = Nonvocational
7 = Incomplete Transcript

*Probability $\leq$ .05

TABLE 3-27

HOURS WORKED PER WEEK BY VOCATIONAL EDUCATION PATTERNS
MEN
(PERCENTAGE DISTRIBUTION)

Patterns	Hours Per Week 0-20	20-35	35-60	60+	n
Concentrator					
Full Sample[1]	9.1*	3.7	81.8	5.4*	121
Not Enrolled[2]	7.3	0.7	85.9	6.1	66
Limited Concentrator					
Full Sample	13.5	10.1	74.1	2.3	216
Not Enrolled	1.5	2.3	94.2	2.0	106
Concentrator/Explorer					
Full Sample	12.8	12.2	73.5	1.5	103
Not Enrolled	0.0	0.0	100.0	0.0	44
Explorer					
Full Sample	2.0	15.6	82.3	5.1	20
Not Enrolled	1.7	0.0	98.3	0.0	12
Incidental/Personal					
Full Sample	20.8	11.0	65.3	2.9	564
Not Enrolled	4.3	8.2*	81.9	5.6	194
Nonvocational					
Full Sample	23.8*	13.9	61.4	0.9*	423
Not Enrolled	0.5	4.5	95.0	0.0*	141
Incomplete Transcript					
Full Sample	16.5	11.2	69.6	2.8	668
Not Enrolled	4.2	4.6	87.4	3.8	276
Total					
Full Sample	18.0	11.2	68.3	2.5	2115
Not Enrolled	3.3	4.5	89.0	3.3	839

NOTE: Percentages shown in the table may not add up to 100 due to rounding.

[1]Complete sample of high school graduates.

[2]High school graduates, not enrolled since 1977.

*Probability $\leq$ .05

TABLE 3-28

HOURS WORKED PER WEEK BY VOCATIONAL EDUCATION PATTERNS
WOMEN
(PERCENTAGE DISTRIBUTION)

Patterns	Hours Per Week 0-20	20-35	35-60	60+	n
Concentrator					
Full Sample[1]	23.7	10.1	65.0	1.2	217
Not Enrolled[2]	9.1	4.1*	86.8	0.0	105
Limited Concentrator					
Full Sample	19.2*	16.1	64.6	0.1	338
Not Enrolled	10.0	12.8	77.2	0.0	154
Concentrator/Explorer					
Full Sample	26.7	14.7	58.6	0.0	215
Not Enrolled	8.6	14.3	77.2	0.0	100
Explorer					
Full Sample	25.0	2.1	72.9	0.0	26
Not Enrolled	0.0	6.9	93.1	0.0	8
Incidental/Personal					
Full Sample	29.3	19.0*	51.5*	0.1	600
Not Enrolled	7.8	14.0	78.2	0.0	185
Nonvocational					
Full Sample	37.0*	14.0	47.6*	1.4	247
Not Enrolled	19.0*	11.6	69.4	0.0	67
Incomplete Transcript					
Full Sample	21.8*	13.8	63.4	1.0	764
Not Enrolled	9.2	12.7	76.6	1.6*	378
Total					
Full Sample	25.5	15.1	58.8	0.6	2409
Not Enrolled	9.6	12.1	77.8	0.6	997

NOTE: Percentages shown in the table may not add up to 100 due to rounding.

[1]Complete sample of high school graduates.

[2]High school graduates, not enrolled since 1977.

*Probability $\leq$ .05

TABLE 3-29

UNIONIZATION FOR MOST RECENT JOB BY SEX, RACE AND VOCATIONAL EDUCATION PATTERNS (IN PERCENTAGES)

Sex and Race	Patterns 1	2	3	4	5	6	7	Total
Men								
Full Sample								
White %	16.2	25.9	20.9	35.7	34.3	30.2	23.3	26.4
n	68	85	43	14	166	106	292	774
Minority %	25.0	34.2	37.0	33.3	34.3	38.8	37.2	35.6
n	32	38	27	3	67	49	172	388
12 Years Education								
White %	16.9	26.7	22.9	33.3	39.1	37.2	26.1	29.2
n	65	75	35	12	128	78	241	634
Minority %	20.0	35.3	41.7	33.3	37.8	35.9	36.6	35.6
n	25	34	24	3	45	39	142	312
Not Enrolled Since 1977								
White %	14.3	26.2	32.1	62.5	41.1	38.9	27.0	31.4
n	42	61	28	8	107	72	189	507
Minority %	26.3	36.7	30.8	50.0	41.0	43.3	43.5	40.0
n	19	30	13	2	39	30	92	225
Women								
Full Sample								
White %	20.5	12.2	17.3	14.3	16.3	10.2	19.6	16.9
n	83	115	75	7	147	59	266	752
Minority %	31.8	25.9	23.8	12.5	23.2	23.1	21.8	23.3
n	22	54	42	8	56	26	165	373
12 Years Education								
White %	18.6	11.2	17.9	20.0	20.2	19.2	21.5	18.6
n	70	98	56	5	94	26	200	549
Minority %	36.8	24.3	25.0	20.0	23.3	22.2	22.7	24.2
n	19	37	32	5	43	18	119	273
Not Enrolled Since 1977								
White %	17.9	9.2	18.2	25.0	17.0	9.7	19.6	16.7
n	56	76	55	4	94	31	194	510
Minority %	40.0	24.1	20.0	20.0	34.5	29.4	23.0	25.8
n	15	29	25	5	29	17	113	233

1 = Concentrator
2 = Limited Concentrator
3 = Concentrator/Explorer
4 = Explorer
5 = Incidental/Personal
6 = Nonvocational
7 = Incomplete Transcript

*Probability $\leq$ .05

TABLE 3-30

TYPE AND SIZE OF FIRM BY SEX AND VOCATIONAL EDUCATION PATTERNS
(IN PERCENTAGES)

Firm	Patterns 1	2	3	4	5	6	7	Total
Multi-establishment								
Men %	48.2	50.1	66.2	80.7	63.1	67.6	58.6	60.2
n	86	164	77	13	317	246	447	1350
Women %	64.5	60.5	58.7	56.3	60.9	45.5	62.8	60.3
n	130	206	148	18	347	113	466	1428
More than 1000 Employees								
Men %	45.6	56.2	43.1	79.1	61.3	48.1	54.3	54.0
n	41	81	51	8	186	158	251	775
Women %	56.8	65.7	55.1	91.5	60.3	51.8	59.8	59.9
n	85	124	86	10	210	51	283	850

1 = Concentrator
2 = Limited Concentrator
3 = Concentrator/Explorer
4 = Explorer
5 = Incidental/Personal
6 = Nonvocational
7 = Incomplete Transcript

*Probability $\leq$ .05

TABLE 3-31

SHIFT WORKED ON MOST RECENT JOB BY SEX AND VOCATIONAL EDUCATION PATTERNS
(PERCENTAGE DISTRIBUTION)

Shift	Patterns 1	2	3	4	5	6	7	Total
Regular Day								
Men	67.3	61.8	63.4	65.5	51.6	53.6	58.8	57.3
Women	64.9	63.6	61.0	76.0	55.1	56.9	62.9	60.8
Regular Evening								
Men	10.1	14.9	18.3*	20.6	10.9	8.8	10.1	11.2
Women	6.3	9.7	12.7	2.1	15.2*	6.3	8.4	10.2
Night Shift								
Men	5.1	4.6	5.5	0.0	8.7	6.2	5.8	6.3
Women	3.9	3.9	3.2	12.4	4.3	3.6	5.3	4.4
Split Shift								
Men	.3	.3	2.2	0.0	1.6	3.9*	1.9	1.9
Women	4.7	2.7	2.3	0.0	2.4	4.8	3.3	3.1
Varying Shift								
Men	17.2	18.4	10.7*	13.9	27.2	27.5	23.4	23.4
Women	20.2	20.1	20.9	9.5	23.1	28.5	20.1	21.5
n								
Men	98	183	85	15	398	277	530	1586
Women	166	259	174	22	416	149	570	1755

NOTE: Percentages in the table may not add up to 100 due to rounding.

1 = Concentrator
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6 = Nonvocational
7 = Incomplete Transcript

*Probability $\leq$ .05

TABLE 3-32

AVAILABLE FRINGE BENEFITS BY SEX AND VOCATIONAL EDUCATION PATTERNS
(IN PERCENTAGES)

Benefits and Sex	Patterns 1	2	3	4	5	6	7	Total
Health Insurance								
Men %	68.0	63.9	71.2	88.3	71.1	65.4	66.8	67.8
n	87	159	80	15	295	223	436	1294
Women %	73.3	72.8	67.2	77.3	62.3	69.3	64.2	66.9
n	142	224	135	18	310	96	474	1398
Life Insurance								
Men %	51.9	53.3	47.3	62.3	56.5	48.4	48.4	51.2
n	85	155	77	15	296	220	424	1272
Women %	62.2	53.3	49.8	61.0	51.7	46.3	49.7	51.9
n	141	221	134	17	308	95	468	1385
Paid Vacation								
Men %	75.7	73.2	71.9	91.8	76.2	69.4	70.5	72.6
n	87	159	80	15	297	223	435	1296
Women %	89.1*	80.1	78.8	98.4	74.2	73.9	75.9	78.0
n	142	224	135	18	312	95	473	1398

1 = Concentrator
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6 = Nonvocational
7 = Incomplete Transcript

*Probability $\leq$ .05

CHAPTER FOUR

MODELS OF EARNINGS AND INCOME

This chapter combines the data already discussed with additional information about earnings and income to resolve some parts of the puzzle that were outlined in chapter 1. The approach is to examine cross tabulations of earnings and income and to estimate a structural regression model that allows for indirect effects from vocational education. The cross tabulations are used to make three comparisons across the vocational pattern groups: comparisons of mean hourly earnings from the principal job the individual holds (or has held most recently); the median hourly earnings from the same job; and reported total annual labor income from any or all jobs that the respondent holds. These three measures of income and earnings provide very different pictures of the effects of vocational education, especially for men. This chapter first discusses the differences that emerge from cross tabulations and then seeks an explanation for some of those differences in a multiple regression analysis of the structural model.

Cross Tabulations: Men

- In cross tabulations, male Concentrators exhibit disadvantages in mean but not median hourly earnings when compared to graduates who have no vocational credits.

- Advantages in annual income of between $1,000 and $2,000 per year are shown for male Concentrators in the full sample of respondents.

- That income advantage is partly due to postsecondary educational involvement of nonvocational graduates. This is apparent because the advantages over students with no vocational credits persist but are smaller when only respondents who have not recently been students are considered.

For men, mean hourly earnings* show that Concentrators are always at a disadvantage when compared to students without any

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*In all the analyses presented in this chapter, observations with hourly earnings reports of less than $.25 per hour or more than $25.00 per hour on the most recent job were regarded as suspect and were not used in the calculations. This restriction eliminated fewer than a dozen cases.

vocational education or students with only Incidental/Personal participation in vocational education. Median hourly earnings, on the other hand, reveal no disadvantage for Concentrators, and annual labor income shows large advantages for Concentrators in some comparisons with Incidental/Personal participants and students with no vocational education. A closer examination of these differences shows some differences between the labor market experiences of vocationally educated and other men.

The comparisons made here use a thirty-five hour work week as a criterion to distinguish between part-time and full-time jobs*, and recent enrollment in postsecondary education to distinguish between people whose principal activity for the last two years has been education and all other respondents. Hence, the earnings tables have four samples. The first sample shows hourly earnings for all high school graduates who had current jobs, without restrictions on the hours that are worked. The second sample shows all high school graduates who had current jobs, but only those who worked more than thirty-five hours per week at that job. The third and fourth samples show groups of high school graduates who had not been enrolled since 1977; people who worked any hours and those who worked more than thirty-five hours per week are treated separately.

Mean Hourly Earnings

Table 4-1 shows that Concentrators in all samples earned less per hour than Incidental/Personal participants and students with no vocational education. Also, Limited Concentrators and Concentrator/Explorers often emerge at a disadvantage compared to those same two groups. Concentrators generally earned less than Limited Concentrators or Concentrator/Explorers, who in turn earned less than Incidental/Personal participants and students with no vocational credits. (There are too few Explorers to compare their mean earnings with those of other patterns.) The disadvantage for Concentrators ranges from about $.10 or $.20 per hour within the group of all students regardless of hours worked, to a maximum of about $.50 per hour within other subsamples.

One exception to this pattern of disadvantage for men who show concentration in vocational education is that Limited Concentrators, regardless of the number of hours worked, earned more than Incidental/Personal and nonvocational participants. Another exception is that Concentrator/Explorers earned about as much per hour as students with no vocational education, and actually earned a little more than Incidental/Personal participants if the

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*The thirty-five hour threshold was selected here because it conforms with usage in other parts of the NLS Youth questionnaire.

comparison is extended to all students and includes jobs worked for any number of hours per week.

Median Hourly Earnings

In contrast to the results for mean hourly earnings, median hourly earnings do not always show a disadvantage for male Concentrators. Between Concentrators and either Incidental/Personal or graduates with no vocational education, the largest negative differential in median earnings is only $.10 per hour. For the full sample of male graduates, without regard to hours, Concentrators show a $.12 per hour advantage over Incidental/Personal participants and a $.06 per hour advantage over respondents without any vocational education. When the comparison applies to students who had not been enrolled since 1977 and who reported working more than thirty-five hours per week, Concentrators earned more than other students with a vocational concentration. Concentrators show a $.20 per hour advantage over Limited Concentrators, and a $.10 per hour advantage over Concentrator/Explorers.

These results for median earnings suggest that for the majority of male respondents, there is very little difference in hourly earnings associated with differences in the graduate's degree of concentration in vocational education. Hence, the distribution of hourly earnings is skewed for those patterns compared to the distribution for Concentrators. Disadvantages in mean hourly earnings for Concentrators arise because a few people in the Incidental/Personal and nonvocational education groups reported very high earnings per hour.

Annual Labor Income

In the comparison of annual labor income, male Concentrators show large advantages over almost all other profile groups when the unrestricted sample is considered. For example, in the 1979 survey year (table 4-2), their advantage over Incidental/Personal and nonvocational students was $1,500 and $2,150 respectively for mean annual income. Similar but smaller differences appear for median annual income. In 1980 (table 4-3) the advantages in mean income were slightly smaller; Concentrators reported $1,300 more per year than Incidental/Personal participants, and $2,000 more per year than students with no vocational credits. Concentrators also reported a higher mean annual income than Limited Concentrators and Concentrator/Explorers. In 1980 they had an advantage of approximately $700 per year.

Median annual earnings show a slightly different picture among the three concentrator groups. In 1979, Limited Concentrators earned the highest median annual income, with Concentrator/

Explorers second, and Concentrators last among the vocational graduates. In 1980, Concentrator/Explorers earned the highest median income, and Limited Concentrators earned the least among vocational concentrators.

This tendency for Concentrators to have higher annual income is moderated if one restricts consideration to those respondents whose most recent experience did not involve school activity. If the sample is restricted to those respondents who had not been enrolled since 1977, the advantage in mean annual income for Concentrators over Incidental/Personal participants disappears and in fact is reversed, as is the advantage of Concentrators over Concentrator/Explorers and Limited Concentrators. Incidental/Personal graduates now actually emerge with a $300 advantage in 1979, and an $1,100 advantage in 1980. Concentrator/Explorers show a $500 advantage over Concentrators in 1979. Even when the sample is restricted to those not enrolled since 1977, however, Concentrators continue to receive more income per year than do respondents with no vocational credits.

Alternative Explanations for the Different Relationships

The tendency for advantages or disadvantages in earnings to depend on whether hourly or yearly measures are used can be traced to differences in the intensity of recent labor market participation. These differences reflect differences in four primary aspects of involvement. First, former vocational students could be more likely to hold multiple jobs. The hourly earnings comparisons reflect only the principal job that the respondent holds, whereas the annual income comparisons can contain income from one or more jobs. As shown in chapter 3, since students with more vocational education are more likely to have held two or three jobs during the 1979-80 period, they may have reported income from more than one job more frequently than Incidental/Personal or nonvocational respondents.

Second, averages for annual income include people who did not work during the calendar year prior to the survey. Their incomes are averaged in as zero along with the incomes of other people who did work. In fact, a detailed analysis of the responses shows more frequent reports of zero income for Incidental/Personal and nonvocational students than for Concentrators, Limited Concentrators, or Concentrator/Explorers.

Third, students with more vocational education, especially Concentrators, have a higher likelihood of working very long hours and a greater likelihood than nonvocational or Incidental/Personal students of working full-time hours (between thirty-five and sixty hours per week). Longer hours may lead to higher incomes if the difference in hours is proportionately greater than the difference in hourly earnings.

Fourth, it was shown in chapter 3 that Concentrators had a greater likelihood than Incidental/Personal or nonvocational graduates of working twenty-seven or more weeks per year. More weeks worked translate into higher annual income, even if hourly earnings and hours worked per week are the same.

This fourth explanation can be investigated in greater detail by a slightly different partitioning of the sample. Table 4-3 shows annual income for four different groups. As with hourly earnings, one group includes all respondents regardless of the number of weeks they work per year or whether or not they had been enrolled recently. The second group includes only those male respondents who had not been enrolled since 1977. The third and fourth groups show corresponding samples, but only for people who have worked at least thirty-nine weeks in the preceding year--the year to which the annual income figure pertains. This partitioning separates the effect of part-time labor force participation and employment over a year from the effect of differences in per period earnings on a job. When only those men with at least thirty-nine weeks of work are considered, the advantage in mean annual income in 1979 and 1980 for Concentrators over respondents with no vocational education is reduced, even without restricting the sample to males who had not been enrolled since 1977. The advantage for Concentrators on median income, however, persists. When both restrictions are imposed (thirty-nine weeks worked and not having been enrolled since 1977), any income advantage for Concentrators over nonvocational graduates is narrowed on the mean comparison and is completely eliminated on the comparison of median annual income. These findings for the most restrictive sample lend support to the notion that the advantages for male Concentrators in annual labor income are attributable to differences in each of the three areas of labor market participation--the number of jobs, hours worked on the job, and the number of weeks worked during a year--when compared to males with no vocational credits and those with the Incidental/Personal pattern of participation.

Cross Tabulations: Women

- In cross tabulations the absence of differences across patterns of participation in hourly earnings among women are attributable to exceptionally high earnings of some nonvocational graduates who work less than full time weeks.

- When only women who usually work more than thirty-five hours per week are considered, Concentrators show mean earnings that are $.30 per hour above those women who have no vocational credits and median earnings advantages that are even greater.

- Both mean and median annual income for women show a consistent pattern of higher income with greater concentration. That relationship holds even among women who have worked at least thirty-nine weeks in the preceding year.

Hourly Earnings

For both hourly earnings and annual income, women exhibit a pattern that is clearer than that for men. For mean hourly earnings (table 4-4) female Concentrators are in the middle of a $.22 per hour range among all vocational graduates: $3.84 to $4.06. Incidental/Personal participants also fall within that range. Yet women with no vocational credits fall about $.30 above this range. As with men, the median earnings values show a smaller range of variation. All the medians fall within about $.10 per hour of each other. These results suggest that the apparent advantage in mean earnings for female students with no vocational credits can be attributed to a few high-earning respondents who skew that distribution and raise the mean.

When the sample is restricted to those women with more than thirty-five hours of work per week, much of the skewness for students with no vocational credits is seen clearly to be attributed to women who work fewer hours per week. With this more restrictive sample, the means vary over a range of only about $.15 per hour, with Concentrators and graduates with no vocational credits both at the top of that range. As with the unrestricted sample, the medians vary only about $.10 per hour. Thus, the apparent advantage for women with no vocational credits disappears when the comparison is focused on people who work essentially a full-time week.*

The advantage in mean hourly earnings for female respondents with no vocational credits can also be seen to be attributable in part to those who are only part-time labor force participants or who have entered the labor force relatively recently. When the sample is restricted to women who have not been enrolled since 1977, the difference between Concentrators and students with no vocational education is reduced from about $.40 to about $.25 per hour. When only those graduates who are working full-time are considered, Concentrators even show an advantage in mean earnings over graduates with no vocational education; the differential is approximately $.30 per hour. Limited Concentrators and Concentrator/Explorers also show advantages of $.20 and $.13 per

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*Although many women who work part time do so for very low wages, these data suggest that a significant portion must be earning very high hourly pay or are understating hours worked.

hour respectively over women with no vocational education. Even Incidental/Personal graduates earn $.10 an hour more than those with no vocational education. If attention is focused on median earnings, the advantage for vocationally educated women is even larger, with a $.40 per hour differential in favor of Concentrators and Concentrator/Explorers and a $.25 per hour advantage for Limited Concentrators when compared to graduates with no vocational credits.

Annual Labor Income

The simplest earnings pattern evidenced in the NLS Youth data is for women's annual income (tables 4-5 and 4-6). In almost all instances, Concentrators have higher annual incomes than Limited Concentrators, who receive more than Concentrator/Explorers, who in turn receive more than either Incidental/Personal participants or women with no vocational credits. The exception to that general rule is in the 1980 survey of incomes for respondents who have not been enrolled since 1977. In that case, when income is measured by the means, Limited Concentrators receive more than Concentrators, and Incidental/Personal participants receive more than Concentrator/Explorers. If income is measured in terms of medians, however, the simpler overall pattern remains.

The income advantage for vocational participants is attributable largely, but not completely, to the greater number of hours worked. If weeks worked per year is restricted to more than thirty-nine, Concentrators still show advantages in annual income when compared to Incidental/Personal graduates and those with no vocational education (1979 data). An income advantage for vocational graduates is maintained in the 1980 data, but the advantage is considerably smaller.

The results for men and women that are based on cross tabulations suggest that the effects vocational education has on earnings differ substantially according to the pattern of labor market involvement of the respondents concerned. This conclusion suggests that a closer look needs to be taken at those relationships while controlling for characteristics of individual respondents that determine the level of earnings. That examination is the focus of the next section of this chapter.

Structural Models of Hourly Earnings

A Model for Regression Analysis

The standard human capital models depict earnings as a function of the following: personal characteristics (such as race and sex); family background (usually measured by the family's

socioeconomic status when respondent was age fourteen); local market characteristics (such as region or rural/urban residence); whether or not the earnings are measured over a short time span; local labor market demand; and accumulated human capital (such as years of education, labor market experience, and tenure on the current job). For certain studies of earnings, various measures of job characteristics, such as industry, unionism, or the riskiness of the job, may supplement this list of regressors, or substitute for other regressors within the equation. Studies of vocational education have inserted measures of participation in secondary vocational education as a reflection of the quality of a portion of the respondent's education. Otherwise, the models estimated in studies of vocational education have looked very much like standard human capital models.

Variation on the human capital approach. A slightly different approach is taken here. It is hypothesized that both direct and indirect effects of vocational education may be present on such outcome variables as earnings and employment. The estimates reported here suggest that indirect effects are important for certain groups of individuals and that the role of vocational education is best understood when both direct and indirect effects are measured.

Indirect effects are estimated here through a series of equations that are linked recursively* in a simplified version of the model from chapter 1 the linkages for which are shown in figure 4-1. Standard elements of the human capital model are used in the earnings equation, but with a sparse set of personal characteristics and measures of human capital and with many indicators of job characteristics. Patterns of participation in vocational education were entered in the earnings equations to estimate the direct contribution to the explanation of earnings. Indirect effects on hourly earnings are transmitted through impacts on the types of jobs into which students move. The earnings equations, therefore, emphasize the role of job characteristics.

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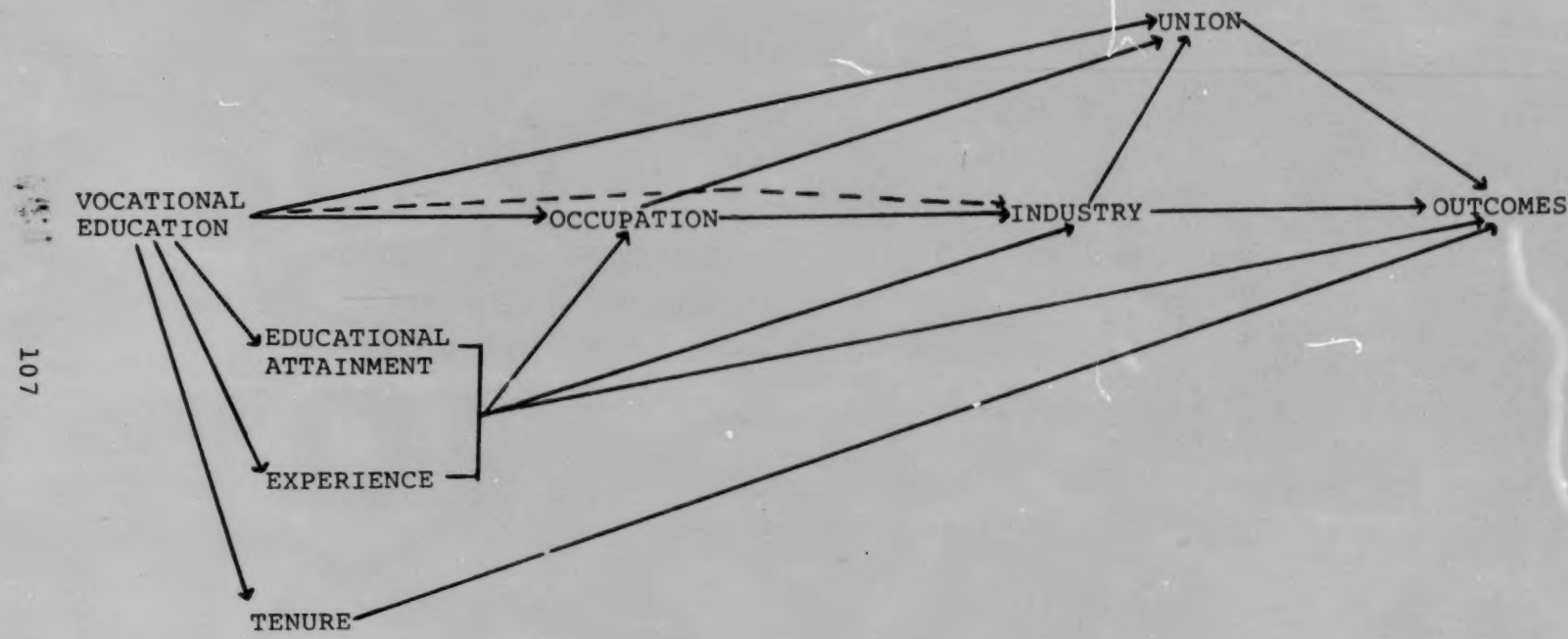
*Why the model is specified as recursive rather than simultaneous is discussed later in the chapter. It is clear that the sequence of effects that is assumed here is not the only one that could be proposed, even if the basic premise of the importance of indirect effects is accepted. It is argued here only that the sequence is plausible. Whether another sequence is more helpful in understanding the effects of vocational education can be answered only through more detailed investigation. The thesis of this report is that regardless of which particular sequence of events best describes outcomes, researchers should in the future focus on these complete sequences of effects.

Figure 4-1

Indirect effects of vocational education
on labor market outcomes



Job characteristics. Characteristics of jobs are reflected in the equations in several ways, all of which were described in more detail in chapter 3. The standard classification of occupations and industries was used, with occupation and industry categories aggregated into the groups defined by the Center for Human Resource Research.* In an alternative specification that was eventually rejected, jobs were characterized by their job family or level of job content as specified by Scoville (1969) and described in chapter 3. Unionized and nonunionized jobs were distinguished, as were full-time (more than thirty hours per week) and part-time (less than thirty hours per week) jobs.

In estimating the model, different types of job characteristics were handled in different ways. The dependent variable in each equation included only earnings on the respondent's current or most recent job as of the 1980 interview (or primary job if respondent held more than one job at the interview date). The sample was restricted to include only those respondents who reported working thirty or more hours per week on that job. (The definition of full time jobs in these equations was liberalized from the earlier definitions to reflect the fairly common practice in personnel policies of considering thirty hours or more full time for the purpose of determining benefits.) Occupation, industry, job family, job content, and unionization characteristics were indicated by sets of binary variables, each of which took on the value of 1 for a case if the characteristic applied, or the value 0 for the case if it did not.

Separate equations were run for each of four combinations of sex and racial/ethnic characteristics. Hence there are four subsamples for most equations: white males, white females, minority (black or Hispanic) males, and minority females. Because of small cell frequencies, however, separate industry and occupation equations were run only for males and females. Minority racial/ethnic status was allowed to have an additive but not an interactive effect in those equations.

Indirect role of vocational education. Vocational education enters the picture by affecting both the likelihood of having jobs with certain characteristics and the amount of accumulation of human capital. The probability that an individual will be found in a job with a particular characteristic (such as being unionized, being in a craft job, or being in manufacturing), were

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*See the tape codebook for the NLS Youth.

estimated initially with linear probability models.* Final forms of those equations were estimated using the probit technique. The results presented here are from the probit estimates. For each respondent the amounts of education, labor market experience, and tenure (on the job to which the hourly earnings figure applies) are estimated by using ordinary least squares (OLS) regression.** Participation in secondary vocational education, as indicated by the pattern variables, is included in all equations.

Final form of the estimating equations. The model that was outlined in chapter 1 suggested that unionization, tenure on the job, labor market experience, years of education, and indicators of the type of job should be included in the earnings equation. The set of job characteristics that explains the greatest fraction of the variance in earnings includes indicators of both industry and occupation. The concepts of job family and job content, though theoretically more satisfactory, did not explain earnings as well.

Even when interactions among industry and occupation are not included in the equation, however, strong collinearity made it difficult to isolate significant contributions of particular industries and occupations. The adjusted R^2 was actually better for the specification that included only industry indicators than for the one that included both industry and occupation categories. Hence, only the industry characteristics were kept in the final earnings equations.

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*The technical problems associated with using linear probability models are well-known. In application, however, they have several advantages, and they generally are robust, yielding estimates that are reasonably close to those generated by more sophisticated methods. See Pindyck and Rubinfeld (1976) and Judge et al. (1980).

**This method is appropriate with the recursive model specified here if the residuals are uncorrelated across equations. Time and resource constraints prevented a full treatment of the system that allowed for correlation of residuals across equations. This is a matter that deserves closer scrutiny in subsequent work. As discussed in the text, some attempts were made to allow for simultaneity among the dependent variables in equations (1) - (7). But in each case the hypothesis of simultaneity was rejected.

The equation estimated for earnings was:*

$$(1) \quad \text{Log Hourly Earnings} = a_0 + a_1 \text{ SES} + a_2 \text{ UNION} + a_3 \text{ TENURE} + a_4 (\text{TENURE})^2 + a_5 \text{ EXPERIENCE} + a_6 (\text{EXPERIENCE})^2 + a_7 \text{ EDUCATION} + \Sigma_j a_{8j} \text{ REGION}_j + \Sigma_k a_{9k} \text{ INDUSTRY}_k + \Sigma_l a_{10l} \text{ PATTERN}_l + u_a$$

The coefficients a_{10l} provide estimates of the direct effects of vocational education.

The probability (P) for a respondent of having a job that falls in any particular industrial category was modeled in equations 2.1 - 2.12.

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*All observations are on individual respondents and each variable has the implicit subscript i. Other subscripts in all the equations have the following ranges:

j = Northeast, South, West (North Central is the reference group).

k = Agriculture, Mining, Construction, Manufacturing, Transportation, Trade, Finance, Business and Repair Service, Entertainment Service, Professional Service, Public Administration (Personal Service is the reference group).

l = Concentrator, Limited Concentrator, Concentrator/Explorer, Explorer, Incidental/Personal, Incomplete Transcript (No Vocational Credits is the reference group). (Sometimes this series includes indicators of program specialty areas: Agriculture and T&I for men, Home Economics and Office for women)

m, n = Professional/Technical, Manager, Sales, Clerical, Craft, Operative, Farmer and Farm Laborer, Service, Household Service (Laborer is the reference group).

For equations 2.1-2.12 and 3.1-3.10, the "reference group" for both the dependent variables is membership in any other occupation or industry. The probability of being in a professional occupation rather than a laborer occupation, for example, is given by P(PROFESSIONAL)/[P(PROFESSIONAL) + P(LABORER)].

(2.1 - 2.12) $$P(\text{Job in kth industry}) = F_I(b_{k0} + b_{k1}\,\text{SES} + \Sigma_j b_{k2j}\,\text{REGION}_j + b_{k3}\,\text{EDUCATION} + b_{k4}\,\text{EXPERIENCE} + \Sigma_l b_{k5l}\,\text{PATTERN}_l + \Sigma_m b_{k6m}\,\text{OCCUPATION}_m)$$

where F is a normal cumulative distribution funciton.

Industry of employment is related to occupation principally because of the nature of the work required in various industries. Teaching skills, for example, usually lead to work either in the professional service industry or in government (public administration). Clerical skills can be used in all industries, but in different degrees. The concentration of certain industries in particular areas of the country implies that region of residence will also be related to occupation. The possibility that employment in a particular industry will determine where a person lives is ignored here because the feedback effect on industry is likely to be a second-order effect. Personal background should be strongly related to occupational choice. But, given occupation, personal background may also have a marginal impact on industry of employment. Without focusing in great detail on that relationship, educational attainment and SES are included to represent the effect of personal background. Some industries (such as retail trade) are much more likely than others to provide entry-level jobs. As youth acquire more experiences they will be somewhat less likely to work in those industries. Hence, experience is included also as an explanatory variable. Finally, patterns of participation are included to test the hypothesis that, even after accounting for these other influences, vocationally educated students tend to show up more frequently in some industries than others.

Occupation is specified in equations (3.1 - 3.10):

(3.1 - 3.10) $$P(\text{Job in mth occupation}) = F_O(c_{m0} + c_{m1}\,\text{SES} + \Sigma_j c_{m2j}\,\text{REGION} + c_{m3}\,\text{EDUCATION} + c_{m4}\,\text{EXPERIENCE} + \Sigma_l c_{m5l}\,\text{PATTERN}_l + \Sigma_n c_{m6n}\,\text{FATHOCC}_n + \Sigma_n c_{m7n}\,\text{MOTHOCC}_n)$$

Occupation is modeled as a function of parents' occupations to allow for the well-established tendency for occupational inheritance. Although the estimated coefficients suggest that this

tendency is weaker with respect to early jobs than to mid-life jobs, three variables were kept in the specification. The SES variable is a scale that reflects a combination of parents' occupational status and education and of early family home environment. That background is related to parents' occupations and to the respondent's education, which is also included as an explanatory factor. But parents' occupation reflects specific occupational involvement and respondent's education reflects specific career preparation. The SES scale is included to reflect a more general influence of the respondent's early background. Regional variation is likely in occupations as it is for industry, and that influence is allowed for. Experience appears in the equation because certain occupations require more employment experience than others as a prerequisite to entry. Finally, vocational education trains students more often for some occupations (such as crafts jobs or clerical work) than for others (such as professional positions). The patterns are included to reflect that effect.

Occupation is modeled to have an influence on industry but to be unaffected by industry. Disregarding the simultaneity between industry and occupation is unrealistic. But estimating a simultaneous system of twenty-three equations by system methods poses serious practical problems, and any misspecification in one equation contaminates estimates of all of the equations. Other considerations also argue for the approach used here. First, the OLS estimation technique that was used in premliminary stages of model selection automatically imposes the restriction that the sum of the estimated probabilities of employment in a category must sum to unity, separately across all the industries and across all the occupations. Simultaneous methods would require complex modification to impose that restriction, especially if probit forms of models were used. Second, although one can cite counterexamples, it seems reasonable to expect that most people place a higher priority on choice of occupation. To the extent that those priorities hold, occupation can be modeled to be determined prior to industry, and sequential rather than simultaneous modeling can be defended. Thus, although industry and occupation are probably best considered to be simultaneous, the treatment here was selected because it was practical, feasible, and reasonably defensible.

Multiple levels of indirect effects. There are several levels of indirect effects of vocational education. As already noted, there are indirect effects of vocational education on earnings that operate through the effect of vocational education on unionization. Unionization, in turn, is assumed to be affected both directly and indirectly by vocational education. For example, the choice of occupation affects the likelihood of being in a unionized job, and vocational education affects the likelihood of being employed in particular occupations. Even here, however, vocational education has effects on the occupation

in which one works that are both direct and indirect. Indirect effects operate through the effects of vocational education on educational attainment and on labor market experience. Whether or not the wage for the respondent's job is set through collective bargaining between the employer and a union is estimated in equation (4) as a function of the respondent's family socioeconomic status at age fourteen, the region of residence, occupation of the job, labor market experience, and pattern of participation in vocational education:

$$(4) \quad P(\text{Job is unionized}) = F_U(d_0 + d_1\ \text{SES} + \Sigma_j d_{2j}\ \text{REGION}_j + \Sigma_l d_{3l}\ \text{PATTERN}_l + \Sigma_m d_{4m}\ \text{OCCUPATION}_m + d_5\ \text{EXPERIENCE})$$

Occupation is included to reflect differences among occupations in the extent of unionization. Region is included to reflect geographic differences in the intensity of unionization and in attitudes toward unionization. SES is introduced to provide some measure of family background that may be indicative of attitudes toward unions and unionized work. Entry to some unionized jobs requires work experience, often in the form of apprenticeship training. Also, normal career advancement in some fields makes one likely to move from nonunionized into unionized jobs. For both of these reasons, experience is also included in the equation.

Early experimentation with equation (4) suggested the pattern of unionization is different for men's jobs than for women's jobs. Industry categories were not significantly related to unionization for men, but the relationship was significant for women. Conversely, occupation was a much poorer indicator of unionization for women than it was for men. This difference is probably attributable to the large fraction of women who work in clerical occupations, since the extent of unionization among clerical workers varies among industries. In light of these results, both occupation and industry indicators were included in the women's unionization equations, but industry indicators were not included in the men's equation.

Some economists have suggested that unions try more intensively to organize jobs with higher pay. This hypothesis seems to suggest a simultaneous relationship between unionization and earnings. That possible simultaneity is not allowed for here because reflection suggests that the relationship may hold in the long run but is probably not relevant when occupation or industry is controlled. It is more reasonable to argue that the likelihood of unionization today depends much more on the structure of

relative wages during the recent past than on today's earnings. That structure is reflected adequately in the occupation and industry variables.

Months of tenure on the current job are estimated as a function of family SES at age fourteen, months of labor market experience, and pattern of participation:

$$(5) \quad \text{TENURE} = e_0 + e_1\ \text{SES} + e_2\ \text{EXPERIENCE} + e_3(\text{EXPERIENCE})^2 + \Sigma_1 e_{41}\ \text{PATTERN}_1 + u_e$$

Experience is important in this equation for two reasons. First, it sets an upper limit on tenure. Second, in the usual path of career development, as people accumulate experience they need less further exploration of new jobs and become more likely to stay at a given job. Age is not included as an explanatory variable. The usual reasons for thinking that job tenure depends on age are actually restatements of the arguments just offered for including an experience variable. But experience is more appropriate than age and is used instead. Similarly, educational attainment might be expected to influence tenure. To the extent that more education reduces tenure by reducing labor market experience, experience is a better measure because it is more direct. To the extent that more highly educated people are likely to get into better types of occupations, occupations would be a more direct indicator than education. But in experiments with the tenure equation, only farm occupations (for white males and females) were significantly associated with differences in tenure. The final form of equation (5) includes that occupational indicator, but no others. Finally, to the extent that more highly educated people are, in some sense, more stable than others, one might expect education to be related to tenure. But such reasoning seems rather speculative. The SES scale may pick up that stability or some effect of family background.

Tenure might also be expected to be related to earnings on the ground that people remain longer in jobs with higher earnings. Although that hypothesis may hold for older workers, it does not seem to hold for this youth sample. When earnings was added to a version of equation (5) that included occupational indicators and equations (1) and (5) were estimated by two-stage-least squares, earnings did not contribute significantly to explaining tenure for any combination of sex and race. This finding may occur because, for earnings to affect tenure, they must reasonably exceed the level available in a different job. This situation probably does not occur until the worker is well past entry level position. Young people may remain on a job long

enough to acquire a desired amount of experience. Earnings would influence the decision of whether a job is attractive as a permanent position, and this type of consideration may be less relevant for youth than it is for older workers. It would still be appropriate, however, to allow tenure to affect earnings for youth, because an employer's increases in pay with greater tenure are not likely to be conditional on the youth's motives for taking the job.

Months of labor market experience are assumed to depend on family SES at age fourteen, respondent's age at the interview date, rural residence, educational attainment, and pattern of participation:

$$(6) \quad \text{EXPERIENCE} = f_0 + f_1\,\text{SES} + f_2\,\text{RURAL} + f_3\,\text{AGE} + f_4\,\text{EDUCATION} + \Sigma_1 f_{51}\,\text{PATTERN}_1 + u_f$$

In labor market studies experience is often defined (especially for men) to be AGE-EDUCATION-5, on the assumptions that people start to school at five years old, no one works while in school, and everyone begins work immediately after graduation and works steadily thereafter. The measure used here is a direct measure of the weeks (converted to months) the respondent has worked since January 1975. Although no distinction is made in the relevant survey questions between full-time and part-time work, the measure used here should be a good indicator of previous work experience. The relevance of age and education are obvious. The SES indicator was included to allow for any effect of family background on the attitude toward a necessity of working early in life. The inclusion of the rural residence indicator was an attempt to allow for differences between urbanized and rural locations in opportunities for work for youth.

Educational attainment (in years) was modeled as a function of family SES at age fourteen, rural residence, region of residence, educational aspirations of respondent, high school grade point average, parents' education, and patterns of participation:

$$(7) \quad \text{EDUCATION} = g_0 + g_1\,\text{SES} + g_2\,\text{RURAL} + \Sigma_j g_{3j}\,\text{REGION}_j + \Sigma_1 g_{41}\,\text{PATTERN}_1 + g_5\,\text{ASPIRATIONS} + g_6\,\text{GPA} + g_7\,(\text{FATHER'S EDUCATION}) + g_8\,(\text{MOTHER'S EDUCATION}) + u_g$$

This specification is relatively straightforward, and a similar equation is explained in detail in Campbell, Gardner and Seitz (1982).

Estimates of Effects

The multiple layers of direct and indirect effects are rather easily illustrated qualitatively in a diagram (see figure 4-1), but they are very difficult to show quantitatively in tables. The only manageable approach is to illustrate the interconnections among the effects and to list the direct effects of vocational education on the intermediating factors separately at each stage of the process. The narrative then weaves together all of the effects. The estimated coefficients for these models are presented in tables for each complete equation. For each of the four subsamples (such as white men) a summary table is presented that shows the direct and indirect effects of participation in vocational education on earnings through each of the intermediating factors.

Within this discussion, Concentrators, Limited Concentrators and Concentrator/Explorers tend to be treated as a group, and the focus is on those three patterns. The impacts are discussed separately for white males, minority males, white females, and minority females. The discussion follows figure 4-1 from left to right, through education, experience, tenure, occupation, union, and industry to earnings.

White Males

- Direct effects of concentration decrease hourly earnings of white males by about 10 percent for Concentrators who do not specialize in agriculture or T&I programs. For those specialists the reduction is only 4 percent. For Limited Concentrators and Concentrator/Explorers who specialize in T&I, earnings are increased by between 4 and 6 percent.

- The largest indirect effect decreases earnings by up to 4 percent because it reduces the likelihood of being in a unionized job.

Education (table 4-7). For white males, concentration in vocational education has no effect* per se on total years of educational attainment. After adjusting for aspirations, scholastic achievement, and parents' education, respondents attain slightly less education if they specialize in trade and industry. But the net effect of concentration and specialization is effectively zero.

Experience and tenure (tables 4-8 and 4-9). Participation in vocational education was associated with more experience as well as more tenure. Experience was higher by about two months for Concentrator/Explorers and Limited Concentrators, and about one month for Concentrators. When the sample was restricted to those respondents who have not been enrolled since 1977 the effects ranged from three to three and one-half months.

Direct effects on tenure are strong only for Concentrator/Explorers. But when indirect effects through experience were added, the total effect was larger for all categories of concentrators. Limited Concentrators showed on average a total effect of one month more tenure on their current job than did people with no vocational education. Concentrators/Explorers exhibited six months more tenure than respondents with no vocational education. Concentrators had increases in tenure of more than one-half of a month in total effect. Specialists in trade and industry reported an additional two to three months of accumulated tenure, while specialists in agriculture had one or two months less tenure.

Occupation (table 4-10). White males who participate in vocational education are much more likely to work in craft-type jobs, slightly more likely to be in clerical jobs, slightly less likely to be in managerial jobs, and much less likely to be in operative, laborer, or service jobs than respondents who had no vocational education. Agricultural specialists are more likely to be in either farmer or farm labor jobs.** In addition to

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*The term "effects" is employed here only with considerable reservation. The impossibility of accounting for all factors that affect an outcome requires researchers to remind readers that the estimated "effects" cited here are apparent effects, and that the estimates are subject to the qualification that causal relationships can never be established only by finding correlations between phenomena. The term "effect" is used only because it is less cumbersome than the more appropriate phrase "difference in outcome."

**There are too few farmers to model that category separately.

those direct effects, indirect effects operating through vocational education and experience reinforce the direct effects, but the indirect effects are relatively small.

Unionization (table 4-11). The likelihood of being in a unionized job is associated strongly, both directly and indirectly, with vocational education. The direct effect shows that vocational education Concentrators were 8 to 18 percent less likely to be in a unionized job. That negative effect was mitigated by 7 percent if the respondents specialized in trade and industry. The indirect effects operate through occupation. The tendency for vocational graduates to work more often in clerical, crafts or farm jobs and not to work in operative or laborer jobs further reduces the likelihood of being in a unionized job. Conversely, the lower likelihood of being in managerial, sales, or service jobs increases the likelihood that the job the individual finds will be unionized. But the conflicting indirect effects operate overall to reinforce slightly the reduced likelihood of being in a unionized job.

Industry (table 4-12). Only for construction and trade does participation in vocational education at the secondary level have direct effects on the industry in which white male respondents work. The principal effect on industry comes indirectly, through the effect of vocational education on occupation or experience.

Specializing in agriculture in vocational education is highly likely to route the individual into a job in either agriculture or manufacturing. For everyone except agricultural specialists, concentration in vocational education is associated with a lower likelihood of working in agriculture.

Participation in vocational education has moderate direct and indirect effects that operate through clerical, craft, managerial and service occupations on the likelihood of working in the construction industry. Agricultural specialists and Concentrators are less likely to be in construction jobs. But Limited Concentrators and Concentrator/Explorers are more likely to be in construction. There is also a small negative indirect effect through labor market experience that tends to reduce the likelihood of other vocational students finding construction jobs.

Several conflicting influences affect the likelihood of being in a manufacturing job. Concentrator/Explorers, for example, are much less likely to be in manufacturing jobs than are respondents with no vocational education. However, the greater likelihood of vocational graduates being in a crafts occupation increases the likelihood that anyone with a concentration will work in manufacturing. The tendency for vocational students to be less likely to be in operative jobs reduces their chances of being in manufacturing jobs. The effect of vocational education on experience, however, gives rise to a small indirect effect

that increases the likelihood of being in a manufacturing job. Overall, Concentrators are about 4 percent more likely to work in manufacturing jobs; Concentrator/Explorers are about 13 percent less likely to work in such jobs.

The effect of vocational education on the likelihood of being in trade jobs is influenced primarily indirectly. It is increased by the greater tendency of vocational students to work in clerical occupations. It is decreased through the much lower likelihood that vocational students are found in managerial or service jobs. It is further decreased by the likelihood of the individual being in a crafts occupation, since crafts occupations are very unlikely to be found in wholesale or retail trade.

Conflicting effects operate on the likelihood of being in business or repair service jobs. Craftspersons are significantly more likely to be in this industry. Thus, participation in vocational education makes one more likely to be in business or repair services. The lower likelihood that vocational students will be in operative, service or managerial occupations tends to reduce their likelihood of being in the business or repair services industry.

The greater likelihood that former vocational students will be in clerical jobs tends to increase their likelihood of being in the professional services industry. The lower likelihood that they will be in service occupations makes them less likely to be in this industry. Overall, these tendencies cancel each other and leave little net effect on the likelihood of working in this industry.

Both direct and indirect effects of vocational education on employment in public administration are rather small and tend to be negative. The indirect effects operate because people holding crafts occupations are much less likely to be in jobs in public administration.

There is no noticeable effect of vocational education, either direct or indirect, that makes the likelihood of being in mining, finance, transportation, or entertainment services any different from the likelihood of being in personal service jobs.

Direct effects on hourly earnings (table 4-13). Earnings are hypothesized in this model to be affected directly by unionization, industry, education, experience, and tenure. Vocational education has effects on hourly earnings both directly and indirectly (to the extent that it affects these other variables). Before considering the effects of vocational education, consider the direct effects that these other influences have on earnings. The effects were estimated using OLS regression equations in which the dependent variable is the natural logarithm of hourly earnings. The coefficients represent estimates of the (assumed

constant) percentage effects of the explanatory variables on hourly earnings.*

For white men, an additional year of education increases hourly earnings by about 3.5 percent when measured in the whole sample. If the sample is restricted to graduates who have not been enrolled since 1977 the effect is virtually eliminated. Tenure and experience have effects on hourly earnings of nearly 1 percent per month. Employment in a unionized job increases earnings by at least 17 percent in all samples. Finally, there are important, statistically significant differences between the earnings of respondents who work in jobs in the personal services industry and white male respondents who work in agriculture, mining, construction, or manufacturing. The industry differences are more substantial when education is held constant.

Indirect, direct, and total effects of vocational education (table 4-14). Indirect effects of at least one-half of a percentage point operate through education, tenure, experience, unionization, and participation in construction or manufacturing jobs. The table presents summaries (for the full sample only) of the estimates of direct, indirect, and total effects. The estimated total effect is the sum of estimates of direct and indirect effects.** The estimate of direct effects comes from the coefficient in the earnings equation (-.0826 for Concentrators). The indirect effect operating through any single source (for example, -.0418 for unionization) is the product of the estimated effect of unionization on earnings (.2123 in table 4-13) and the total effect of being a Concentrator on the likelihood of being in a unionized job (-.1967 = -.1845 (from table 4-12) - .0122 (sum of indirect effects of Concentrator on unionization)).

The tendency for concentration in vocational education and a specialization in trade and industry to reduce accumulated years of education tends to reduce slightly the hourly earnings of

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*The use of quadratic terms for experience and tenure permits their marginal impact to vary. Entries in tables 4-14, 4-19, 4-27, and 4-32 report the effect of acquiring one additional month of experience or tenure, assuming for purposes of illustration that the individual had already accumulated twelve months of both tenure and experience.

**That is, in the table, total effect = direct effect + indirect $effect_1$ + indirect $effect_2$ +. . . . Strictly speaking, because of the logarithmic specification, total effect = [(1 + direct effect) (1 + indirect $effect_1$) (1 + indirect $effect_2$). . .] -1. Both methods give approximately the same result with effects of the magnitudes involved here.

respondents. The tendency for tenure and experience to be increased implies that vocational education raises earnings through these indirect routes. Strong positive effects of unionization on earnings translate into a strong tendency for participation in vocational education to reduce earnings by reducing the likelihood of being employed in a unionized job. Specialization in agriculture has effects that depend on the industry into which the respondent moves. Agricultural specialists who move into agricultural jobs tend to earn less than students with no vocational education who work in the personal services industry. The effect of vocational education on being in crafts occupations tends to raise the likelihood that vocational participants will be in construction jobs, and that rise tends to increase the average earnings that vocational graduates receive. On earnings there is a moderately positive indirect effect of vocational participation through the slight increase in the likelihood that vocational students will be in manufacturing jobs. The tendency of vocational Concentrators, Limited Concentrators, and Concentrator/Explorers not to be found in trade or public administration tends, on average, to boost their earnings compared to respondents who had no vocational education and who worked in the personal services industry.

The total effect on earnings (-.1015 for Concentrators, for example) is dominated by the direct effect (-.0826). The sum of indirect effects is small (-.0189). But that small sum masks the individual indirect effects (each of at least .5 percent) that operate through education, tenure, experience, unionization, construction, and manufacturing. For white male Concentrators, the direct and total effects are rather large. The estimates obtained here from the NLS Youth data show larger disadvantages in hourly earnings for vocational education participants than do previous estimates from other data sets. A large part of the disadvantage is attributable to the nonunion character of the jobs that are held by vocational graduates. But the dominant portion is attributable to substantial direct effects on earnings.

Minority Males

- Direct effects decrease earnings substantially for minority male Limited Concentrators and Concentrator/Explorers.

- Indirect effects through union tend to reduce earnings; those through education, transportation, construction, and manufacturing increase earnings.

Education (table 4-15). For minority males, concentration in vocational education by itself increases the total amount of education accumulated by about a quarter of a year. For

Concentrators who are also trade and industrial specialists, the amount of education is reduced by up to one-quarter of a year. That reduction is much smaller for Concentrators than it is for Limited Concentrators or Concentrator/Explorers. If the sample is restricted to respondents who have not been enrolled since 1977, being a Concentrator actually increases educational attainment by about one-fifth of a year, even if the concentration was in a trade and industry program.

Experience and tenure (tables 4-16 and 4-17). Concentration affects the amount of accumulated labor market experience in different ways for different patterns of participation. For Concentrators, tenure is reduced; for Limited Concentrators and Concentrator/Explorers it is increased. Indirect effects of vocational education on experience are felt through the effect of vocational education on accumulated years of education. For a given age, each additional year of education reduces the accumulated experience, on average, by about one and three-quarters months. Thus, the indirect effect of vocational education is to reduce experience by small amounts, except for specialists in trade and industry.

Vocational concentration has large effects on tenure. Increases of four to nine months are found for all participants except for specialists in agriculture or trade and industry. But Concentrators specializing in trade and industry still have about three months longer tenure than do graduates with no vocational credits. The Limited Concentrators and Concentrator/Explorers specializing in trade and industry have about two months less job tenure than graduates with no vocational credits. Thus, the direct effect of concentration and the direct effect of specialization in agriculture or trade and industry tend to offset each other for minority males.

Indirect effects that operate through the impact of a trade and industrial speciality on education are small and tend to reduce the amount of tenure accumulated. The indirect effect through experience acts to reduce tenure for Concentrators and to increase it for Limited Concentrators and Concentrator/Explorers who are not trade and industrial specialists.

Occupation (table 4-10). The estimated effects of vocational education on occupational employment were assumed to be the same for whites as for minorities. Hence the direct effects will be the same for both groups. The indirect effects, which operate through education, also happen to be much the same, though they were not constrained to be.

Unionization (table 4-11). A consistent tendency exists for Concentrators, Limited Concentrators, and Concentrator/Explorers to be less likely than graduates with no vocational credits to be in a unionized job. The tendency is much more pronounced for

Concentrators and Limited Concentrators. Indirect effects on unionization are small in comparison to the direct effects, and make a difference of at most 2 percent.

Industry (table 4-12). As was the case with occupation, the direct effects of vocational education on working in a particular industry are assumed to be the same for minorities as for whites. The indirect effects also turn out to be much the same.

Earnings (table 4-18). The factors that directly influence earnings have different marginal effects for minority men than they do for white men. Being in a unionized job increases hourly earnings for minority men by only about half of the percentage that it does for white men. On the other hand, the percentage wage differentials associated with being in mining, construction, manufacturing, or transportation jobs are much larger for minority men than they are for white men, and there are positive differentials for all industries compared to personal service. The estimated effects range from 7 percent for entertainment services to up to 80 percent for mining. These effects are strongest when the sample is restricted to those respondents who have exactly twelve years of education. When the amount of education is allowed to vary, the marginal impact of education on earnings is about 6 percent, or about one and three-quarters times as large for minority men as for white men. The effects of tenure and experience on the hourly earnings of minority men vary among patterns of participation and from sample to sample. For Limited Concentrators and Concentrator/Explorers the effects are positive. For Concentrators the effect is negative. The magnitude of both these effects is between 1 and 2 percent.

Indirect, direct, and total effects of vocational education (table 4-19). Participation in vocational education operates through educational attainment, experience, tenure, unionization, construction, manufacturing, and transportation to produce some indirect effects on hourly earnings. The effect of vocational participation on education and experience increases earnings for Limited Concentrators and Concentrator/Explorers by about 3 percent. But the quadratic term for tenure leads to the interesting result that the marginal effect of vocational education on tenure is large enough that the effect on earnings is negative.

Because of the lower direct effect of unionization on earnings, the effect of vocational education on the likelihood of being in a union has a smaller impact on earnings for minority men than it does for white men (for Concentrators, less than half the effect).

Other indirect effects operate through industry. The lower likelihood for being in mining, for example, reduces hourly earnings slightly. In contrast, the higher likelihood of being in

construction increases earnings by nearly 2 percent. For Concentrators, the greater likelihood of being in manufacturing also increases earnings by nearly 1 percent.

As with white men, concentration in vocational education is associated with direct effects that reduce earnings. Unlike white men, however, minority Limited Concentrators and Concentrator/Explorers have larger negative effects than for Concentrators. Also unlike white men, the direct effect of specialization in agriculture completely offsets the direct effect of being a Concentrator, and specialization in trade and industry nearly offsets it. Indirect effects on earnings are, on balance, positive for all three categories of concentrators and negative for both specialties. The indirect effects mitigate somewhat the negative direct effects on earnings.

White Females

- White female Concentrators have substantial earnings advantages over other women.
- Indirect effects through tenure, experience, transportation, trade, finance, and unionization increases the advantage.

Education (table 4-20). Among all white females, Concentrators, Limited Concentrators, and Concentrator/Explorers have about one year less education than white females with no vocational credits. Among white females who had not been enrolled since 1977, the reduction is only one-half of a year. Within both samples, greater concentration is associated with fewer years of education. Although office specialists who are Concentrators have less education than nonvocational students, they are about one-fifth of a year closer than other female Concentrators to the educational attainment of nonvocational students.

Experience (table 4-21). Among Concentrators and Limited Concentrators, labor market experience increases (in total effect) by about five and one-half months. These figures include an increase of about one-half month that operates through educational attainment. Even if education is held constant at twelve years, experience is higher by three and one-half months. Apparently, part of the estimated effect of vocational education on experience is associated with the relationship between vocational concentration and total years of education.

Tenure (table 4-22). As with experience, concentration tends to increase tenure by substantial amounts. The increase is even greater when the individual has specialized in home economics or office occupations. In addition to a direct effect of three and one-half months, concentration operates through

experience to increase tenure by about two and one-half months. For Concentrators, the total effect is to increase tenure by about six months (or between seven and nine months if the respondent specialized in home economics or office occupations). For Limited Concentrators and Concentrator/Explorers, the indirect effects on tenure operating through experience dominate the direct effects, giving increases of two and one months, respectively.

Occupation (table 4-23). Concentration strongly increases the likelihood that white females will be in clerical jobs. The effect is less strong but still statistically significant for Limited Concentrators, and is even less strong but still significant for Concentrator/Explorers. As one would expect, this effect is not present for specialists in home economics. Indirect effects operating through the amount of education tend to reinforce these direct effects and increase further the likelihood of white females being in clerical occupations.

There is some pattern of influence on the likelihood of women being in jobs that require manual labor. There is, for example, a weak tendency for concentration in vocational education to increase the likelihood of being a laborer. That effect is reinforced by the indirect effect of vocational education to reduce total amount of education acquired. (Reductions in total education increase the likelihood of being a laborer.) There are conflicting direct and indirect effects on the likelihood that white females will be in operative jobs. The direct effect of vocational concentration tends to reduce the likelihood of being in an operative occupation. The indirect effects through education tend to increase the likelihood of being in operative occupations because they reduce the level of education. The net effect is slightly negative and in the range of 1 to 2 percent.

Concentration in vocational education tends to reduce slightly the likelihood of being in professional or managerial jobs--an effect that is small but consistent. The indirect effects operating through education reinforce the direct effects with respect to professional jobs. Vocational participation directly reduces substantially the likelihood of being in a service occupation. Because vocational education tends to reduce the amount of education, it also tends directly to increase the likelihood of being in a service occupation, but that effect is at most one-fourth as strong as the direct effect. Thus, the negative direct effect on service employment dominates and gives negative estimates for each category of concentrator that are about half the magnitude of the large positive estimates for clerical workers.

Unionization (table 4-24). For the full sample of white women, participation in vocational education has a weak direct impact on the likelihood of being in a unionized job. When

education is held constant and among women who had not been enrolled since 1977, participation in vocational education is associated with a lower likelihood of being in a unionized job. The most important effects are indirect, and they work through the respondent's occupation. Women operatives, for example, show about a 25 percent higher chance of being in a unionized job. Women clericals have about an 18 percent higher chance of working in a unionized job. The tendency for vocational Concentrators to work in clerical jobs raises the overall likelihood of being in a unionized job by about 5 percent. The total effect for Concentrators is a 6 percent higher chance of being in a unionized job. This likelihood rises by another 4 percent if the graduate specialized in the office field.

The relationship here between vocational participation and unionization contrasts sharply with that same relationship for men. There is no strong tendency for women who participate in vocational education to be less likely to be found in unionized jobs. If anything, white women are more likely to be unionized when they are Concentrators in vocational education, especially if they train specifically for office jobs.

Industry (table 4-25). Among women, there are too few cases to model the likelihood of being in agricultural, mining, or construction jobs. Where sufficient cases are available, the evidence suggests that participation in vocational education usually has small direct effects on the industry in which white females find jobs. There are, however, effects in the range of 6 percent and 3 percent that reduce the likelihood of being in manufacturing or professional service jobs, respectively. Significant but small effects were estimated also for finance.

The principal effects on industry arise because of the impact of vocational education on occupation. Women in crafts, operative, or sales occupations, for example, are more likely to be in the manufacturing industry. But vocationally educated women are less likely to work in these occupations. That indirect effect reduces the likelihood that a white female vocational graduate works in manufacturing. Working in clerical occupations increases the likelihood of being in transportation, trade, finance, and professional services. In transportation, trade, and finance those indirect effects dominate all other effects to give total effects associated with more likely employment in those industries. But the effects of clerical occupation are not strong enough to make vocational graduates more likely than white women with no vocational credits to work in manufacturing or professional service. It also tends strongly to reduce their involvement in the personal service industry. Thus, the effects of vocational education on the industry in which a white female's job is likely to be located are clear and strong, but they are predominantly indirect, and operate through the influence on the likelihood of being in a clerical occupation.

Earnings (table 4-26). As with men, the direct effects of education, tenure, experience, unionization, and industry of the job on earnings create routes through which vocational education can have indirect impacts. An additional year of education directly raises the earnings of a white female by between 3 and 5 percent. An increase of one month in tenure raises hourly earnings by .3 percent, and an additional month of experience raises earnings by more than 1 percent. These effects of education, tenure, and experience on earnings tend to be consistently strong regardless of whether the sample is restricted to women with a constant level of education or to women who have not been enrolled since 1977.

Being in a union has a strong effect on white women's earnings. It increases average hourly earnings by 8 to 11 percent. This effect is smaller than for white men by about a factor of one-half, but it is close to the estimate for minority men. Employment in any of the identified industries raises average earnings for white females by 25 to 40 percent over what those same women would earn in the reference group industry, where the reference group includes not only personal service (although personal service is predominant) but also agriculture, mining, construction, and entertainment.

Indirect, direct, and total effects of vocational education (table 4-27). Participation in vocational education affects women's earnings indirectly through the channels that have just been mentioned. Being a Concentrator, for example, is associated with earnings that are lower by about 3 percent because it is associated with fewer years of education. When it operates through tenure and experience, concentration in vocational education has a moderately strong tendency to increase earnings. In the full sample of white women, the higher amounts of experience and tenure that are associated with concentration raise earnings by 4.5 and 9 percent.

The effect of vocational education that operates through the likelihood of being in a union is small for women. If anything, it tends to increase earnings slightly. This is in sharp contrast to the result for men.

The tendency of vocationally educated women to move into particular occupations or industries has indirect effects on earnings. White women in clerical occupations in transportation, trade, or finance earn about .5 percent more than women in personal service jobs. At the same time, participating in vocational education and working in a clerical job tend to keep women away from being in low paying personal service jobs.

Direct effects of concentration on earnings range from an increase of 5 percent for Concentrator/Explorers to an increase of 10 percent for Concentrators. Specialization in an office

program reduces those differentials by about 5 percent. Indirect effects that operate through educational attainment to reduce earnings by about 3 percent are more than offset by positive indirect effects through tenure, experience, unionization, and employment in trade, transportation, or finance. The sum of indirect effects contributes 6 percent towards an earnings advantage for Concentrators, about 1 percent for Limited Concentrators, and about 1.5 percent for office specialists. The total advantages are about 17, 11, and 4 percent for Concentrators, Limited Concentrators, and Concentrator/Explorers, respectively. Specialization in an office program or an occupational home economics program reduces those advantages by about 4 percent.

Minority Females

- Minority women's earnings are increased by indirect effects through tenure, experience, transportation, trade, finance, public administration, and unionization.

- The largest impact is a direct effect of 11 percent for office specialization on earnings.

Education (table 4-28). Participation in vocational education affects the educational attainment of minority females very much in the same way it affects that for white females when the sample is restricted to those respondents who had not been enrolled since 1977. But effects in the full sample are small and inconsistent. There is some tendency for Concentrators to have fewer years of education, but the estimate is not statistically significant and is cut in half for office specialists.

Experience and tenure (tables 4-29 and 4-30). Concentration in vocational education has small and inconsistent impacts on the likely amount of labor market experience of minority women in the full sample. If the sample is restricted, however, to those not enrolled since 1977, Concentration increases experience by about three months.

Participation in vocational education as a Concentrator in specialties other than office or home economics reduces average tenure by a large amount--anywhere from seven to nine months. Specialization in office occupations or home economics moderates that to a reduction of three to five months.

Occupation and industry (tables 4-23 and 4-25). As was the case for men, effects on occupation and industry are assumed to be the same for minority women and for white women with regard to occupation. There are no essential differences between white and minority women in the indirect effects of vocational education on the industry of employment. Overall, Concentrators, Limited

Concentrators, and Concentrator/Explorers are much more likely to be in clerical jobs and slightly more likely to be in laborer jobs. They are less likely to be in managerial or professional jobs and much less likely to be in service jobs. The principal differences are that minority women vocational graduates are just as likely as women with no vocational credits to be in sales occupations, and they are even less likely than for white women to be in operative jobs.

Unionization (table 4-24). For minority women, being a Concentrator, Limited Concentrator, or Concentrator/Explorer (as long as one is not an office specialist) substantially increases the likelihood of being in a unionized job. The strongest direct effect for vocational participants relative to those with no vocational credits is shown when the sample is restricted to only those minority females with exactly twelve years of education. Being an office specialist, however, offsets virtually all of the effect of being a Concentrator on the likelihood of being in a union. Moreover, being in a clerical occupation reduces the likelihood of being in a unionized job by about an additional 5 percent. The total effect on unionization for minority women who are office specialists is to reduce the likelihood of unionization by about 3 percent.

Earnings (table 4-31). Earnings of minority females are directly affected by education, industry, and experience. They are affected only slightly by tenure. The direct effect of an additional year of education is to raise minority female earnings by 5 to 8 percent. An additional month of experience increases earnings by about 1.5 percent. Working in the manufacturing, transportation, finance, professional service, or public administration industries increases earnings by 60 to 100 percent more for minority females than employment in those same industries does for white females. This means the net earnings differential is between 40 and 60 percent. (Recall that these differentials for women are compared to the personal service industry, where few vocationally educated women are found.) Being in a union has a strong direct effect for those respondents who have not been enrolled since 1977 and a smaller but still important effect for other samples.

Indirect, direct, and total effects of vocational education (table 4-32). Concentration has small direct effects on earnings, but specialization in an office program raises earnings both directly and in total by about 11 percent. The strong tendency of vocational education to reduce the amount of tenure that a respondent has on a current job actually contributes indirectly to higher hourly earnings because longer tenure is associated with lower hourly earnings for minority females. Concentration in vocational education has small and mixed indirect effects through the accumulation of labor market experience. Unionization transmits little indirect effect on earnings for minority women.

Employment in certain industries confers advantages on minority women participants in vocational education. Those industry differences appear to dominate the effects of education and experience that have just been mentioned. For example, the increased tendency for vocational Concentrators to be in finance, trade, transportation, or public administration jobs and the decreased tendency to be in personal service jobs accounts for most of the positive differential for minority females.

The total effect on earnings for minority women is mixed. Concentrators have about a 3 percent advantage over women with no vocational credits. Limited Concentrators, however, show an 8 percent disadvantage, and Concentrator/Explorers have about a .5 percent disadvantage. But if these participants specialize in an office program, their earnings prospects are improved (principally through a direct effect) by about 11 percent.

Summary

The difficulty in summarizing the discussion immediately preceding is that its essence is in its detail. Perhaps the single most important conclusion to stand out from the discussion is the strong evidence that vocational education students are heterogeneous. The effects of vocational participation differ substantially, depending upon the degree of involvement, the area of specialization, and the vagaries of finding employment in particular occupations and industries.

In addition to the diversity among vocational students, several interesting comparisons emerge between the results of cross tabulations and those from regression. For mean hourly earnings for men, the pattern of advantages that is exhibited in cross tabulations is found also when multiple influences are corrected for in regression analyses. This result suggests that the estimates of negative direct and total effects found for male Concentrators are attributable to those few nonvocational graduates whose very high earnings skew their distribution. In view of the absence of disadvantages in median earnings for vocationally educated men, the negative regression estimates are unlikely to be due to any tendency for most vocational graduates to earn less than most nonvocational graduates. The negative regression estimates are most likely attributable to a relatively small number of nonvocational graduates who do exceptionally well.

Concentrators receive more income per year than do students with no vocational credits, even when the sample is restricted to respondents who have not been enrolled since 1977. This result suggests that the advantages in annual income are not associated with the typical instability of a postsecondary student's attachment to the labor market. The advantages arise, rather, because of differences in labor market attachment among high school

graduates who are not currently students. As shown initially in chapter 3 and reaffirmed here, the differences in attachment are manifested through longer hours per week, more weeks worked per year, and a greater tendency to work at more than one job (but not necessarily at the same time) over the course of the year.

Differences in participation in secondary vocational education are associated both directly and indirectly with differences in earnings. Although noteworthy indirect effects operate for men through industry, unionization, tenure, experience, and education, the direct effects seem to be larger.

For women, the regression analyses of hourly earnings tend to bear out the conclusions drawn from the cross tabulations. The cross tabulations suggested that any apparent advantage for women with little or no vocational education was attributable primarily to the higher than average hourly earnings of some non-vocational women graduates who work less than full time weeks. When the comparisons were restricted to those women who worked full time, vocational graduates showed substantial advantages over women with no vocational credits. Those advantages were reflected also in large, positive direct and indirect effects in the regression model for vocational graduates. The advantages in hourly earnings extended also to annual income. For both mean and median measures, greater concentration was associated consistently with higher annual income for women.

TABLE 4-1

EARNINGS PER HOUR ON MOST RECENT JOB BY PATTERNS
OF VOCATIONAL PARTICIPATION, 1980 SURVEY
MEN
(IN DOLLARS)

	Concentrator	Limited Concentrator	Concentrator/ Explorer	Explorer	Incidental/ Personal	Nonvocational	Incomplete Transcript
Full Sample							
Mean	4.77	5.12	4.97	4.91	4.89	4.98	4.97
Median	4.25	4.25	4.25	3.50	4.13	4.19	4.25
n	119	189	98	23	438	304	707
More than 35 Hours Per Week							
Mean	4.72	5.40	5.09	5.05	5.20	5.24	5.25
Median	4.42	4.69	4.50	3.32	4.54	4.51	4.50
n	106	143	77	20	312	198	525
Not Enrolled Since 1977							
Mean	5.21	5.53	5.48	6.03	5.75	5.65	5.56
Median	4.88	4.77	4.91	4.74	5.00	5.00	4.50
n	64	96	42	11	157	107	319
Not Enrolled Since 1977: More than 35 Hours Per Week							
Mean	5.13	5.51	5.48	6.03	5.61	5.65	5.56
Median	5.00	4.81	4.91	4.74	5.10	5.00	4.56
n	61	93	42	11	140	100	284

TABLE 4-2

ANNUAL INCOME FOR MEN BY PATTERNS OF VOCATIONAL PARTICIPATION, 1979 SURVEY
(IN DOLLARS)

	Concentrator	Limited Concentrator	Concentrator/ Explorer	Explorer	Incidental/ Personal	Nonvocational	Incomplete Transcript
Full Sample							
Mean	6463	6468	6228	7757	4955	4309	5044
Median	4130	4584	4500	3700	3000	3000	2500
n	89	166	79	15	404	296	599
Employed More than 26 Weeks							
Mean	6705	7907	6366	9754	6385	5686	6570
Median	5775	6375	5000	8700	4100	4600	5000
n	65	112	58	9	225	159	301
Employed More than 39 Weeks							
Mean	7214	8661	6988	10427	7436	6722	7386
Median	5944	7000	6000	9500	6000	5000	6400
n	52	90	44	6	150	115	228
Not Enrolled Since 1977							
Mean	7003	7539	7464	9780	7294	5854	6685
Median	5400	6750	6500	5000	6000	4600	4500
n	71	99	41	12	176	121	309
Not Enrolled Since 1977: Employed More than 26 Weeks							
Mean	7025	8279	7687	11043	8240	6841	7864
Median	5888	7042	6750	8850	6900	6000	7000
n	53	75	34	8	114	77	165
Not Enrolled Since 1977: Employed More than 39 Weeks							
Mean	7377	8585	8537	12303	8770	7248	8620
Median	5944	8000	7719	10000	7200	6000	8000
n	44	62	26	5	94	67	134

TABLE 4-3

ANNUAL INCOME FOR MEN BY PATTERNS OF VOCATIONAL PARTICIPATION, 1980 SURVEY
(IN DOLLARS)

	Concentrator	Limited Concentrator	Concentrator/ Explorer	Explorer	Incidental/ Personal	Nonvocational	Incomplete Transcript
Full Sample							
Mean	7643	6910	6973	7338	6368	5629	5701
Median	5450	5000	5000	4500	4000	3500	3000
n	130	211	109	26	512	360	882
Employed More than 26 Weeks							
Mean	8390	7979	7844	8706	8100	7204	7482
Median	7500	7039	7000	7404	5973	6000	6176
n	93	149	81	17	318	225	456
Employed More than 39 Weeks							
Mean	9006	8688	8359	7360	9414	8103	8252
Median	8500	8000	8000	5700	7900	7200	7550
n	81	125	67	14	230	176	348
Not Enrolled Since 1977							
Mean	9667	9574	10143	10274	10784	9283	8012
Median	8750	8816	9378	8500	9345	9000	5000
n	69	100	44	13	168	112	376
Not Enrolled Since 1977: Employed More than 26 Weeks							
Mean	10359	10106	10352	10932	11957	9808	9394
Median	9000	9000	10000	11750	10460	9450	8363
n	55	80	39	10	133	92	212
Not Enrolled Since 1977: Employed More than 39 Weeks							
Mean	10833	10659	10465	9430	12373	10505	9887
Median	9500	9115	10000	9500	11000	10000	9000
n	50	74	37	8	120	76	175

TABLE 4-4

EARNINGS PER HOUR ON MOST RECENT JOB BY PATTERNS
OF VOCATIONAL PARTICIPATION, 1980 SURVEY
WOMEN
(IN DOLLARS)

	Concentrator	Limited Concentrator	Concentrator/ Explorer	Explorer	Incidental/ Personal	Nonvocational	Incomplete Transcript
Full Sample							
Mean	3.92	3.84	4.06	4.32	3.89	4.30	3.81
Median	3.55	3.50	3.50	3.87	3.45	3.50	3.47
n	176	290	200	24	456	193	736
More than 35 Hours Per Week							
Mean	4.14	4.01	4.00	4.52	4.05	4.13	3.99
Median	3.76	3.75	3.67	4.38	3.75	3.66	3.65
n	119	194	130	18	244	111	483
Not Enrolled Since 1977							
Mean	4.23	4.16	4.17	4.51	4.20	4.48	3.92
Median	3.95	3.83	3.74	3.65	3.80	3.58	3.51
n	81	121	96	10	150	59	378
Not Enrolled Since 1977: More than 35 Hours Per Week							
Mean	4.30	4.22	4.15	4.57	4.11	4.02	3.94
Median	4.00	3.84	3.99	3.50	3.80	3.58	3.64
n	72	99	78	9	115	47	308

TABLE 4-5

ANNUAL INCOME FOR WOMEN BY PATTERNS OF VOCATIONAL PARTICIPATION, 1979 SURVEY
(IN DOLLARS)

	Concentrator	Limited Concentrator	Concentrator/ Explorer	Explorer	Incidental/ Personal	Nonvocational	Incomplete Transcript
Full Sample							
Mean	4505	3456	3251	3344	2977	2420	3243
Median	3000	2245	2000	2000	2000	1437	1538
n	159	280	194	20	433	218	765
Employed More than 26 Weeks							
Mean	5703	4717	4397	3933	4084	3837	4751
Median	5000	4000	3500	2600	3000	2550	4000
n	105	152	107	8	237	102	367
Employed More than 39 Weeks							
Mean	6347	5073	4947	4413	4712	4521	5206
Median	5839	4500	4000	2700	4000	3000	4800
n	82	120	79	7	162	68	279
Not Enrolled Since 1977							
Mean	5472	3971	3838	3128	3790	3046	3790
Median	4950	3100	3100	2250	3000	2000	2000
n	102	162	111	10	177	75	474
Not Enrolled Since 1977: Employed More than 26 Weeks							
Mean	6958	5081	4816	3176	5075	4439	5449
Median	6000	4600	3866	2500	4220	3200	5000
n	70	93	66	5	103	39	214
Not Enrolled Since 1977: Employed More than 39 Weeks							
Mean	7181	5367	5406	3176	5453	5375	5832
Median	6000	5000	4924	2500	5000	3900	5259
n	63	77	49	5	83	27	168

TABLE 4-6

ANNUAL INCOME FOR WOMEN BY PATTERNS OF VOCATIONAL PARTICIPATION, 1980 SURVEY
(IN DOLLARS)

	Concentrator	Limited Concentrator	Concentrator/ Explorer	Explorer	Incidental/ Personal	Nonvocational	Incomplete Transcript
Full Sample							
Mean	4610	4681	3673	4758	3457	2863	3600
Median	3253	3000	2800	3000	2000	1621	2000
n	215	364	242	28	599	262	1027
Employed More than 26 Weeks							
Mean	5731	6369	5145	6336	4646	4171	5120
Median	4800	5124	4500	4000	3300	3301	4500
n	151	216	144	19	349	132	513
Employed More than 39 Weeks							
Mean	6416	7266	5748	7216	5570	4923	5916
Median	5500	6100	5200	500	4785	4080	5800
n	117	168	111	14	243	92	355
Not Enrolled Since 1977							
Mean	6212	6405	4677	6484	5356	4358	4344
Median	6000	5700	4000	3000	4000	3500	3000
n	98	157	115	11	181	75	528
Not Enrolled Since 1977: Employed More than 26 Weeks							
Mean	7122	8294	6272	7559	6495	6517	5929
Median	7000	7000	6000	4000	6000	6000	5800
n	79	103	79	8	126	44	281
Not Enrolled Since 1977: Employed More than 39 Weeks							
Mean	7422	8860	6685	8198	7316	7151	6482
Median	7000	7310	6500	6500	7000	6500	6300
n	68	88	65	6	99	36	222

TABLE 4-7

DETERMINANTS OF YEARS OF EDUCATION

(OLS ESTIMATES FOR EQUATION (7))

WHITE MEN

VARIABLE	FULL SAMPLE		NOT ENROLLED SINCE 1977	
INTERCEPT	9.85	(14.62)	12.00	(24.72)
CONCENTRATOR	0.13	(0.80)	0.04	(0.36)
LIMIT CONCENTRATOR	0.08	(0.59)	0.03	(0.34)
CONCENTRATOR/EXPLOR	0.16	(1.01)	0.07	(0.66)
EXPLORER	-0.01	(-0.04)	0.05	(0.31)
INCIDENTAL/PERSONAL	0.17	(1.71)	0.01	(0.24)
INCOMP. TRANSCRIPT	0.89	(4.53)	0.37	(2.60)
AGRIC. SPECIALTY	-0.04	(-0.30)	-0.01	(-0.10)
T&I SPECIALTY	-0.20	(-1.73)	-0.12	(-1.62)
SOCIOECONOMIC SCALE	0.04	(2.79)	0.03	(2.62)
RURAL RESIDENCE	0.00	(0.00)	0.03	(0.69)
NORTHEAST	0.22	(2.75)	0.06	(1.23)
SOUTH	0.11	(1.48)	0.06	(1.20)
WEST	-0.06	(-0.75)	0.01	(0.29)
YEARS ED ASPIRED TO	0.17	(11.94)	0.05	(5.30)
ASPIR. DATA MISSING	2.51	(5.86)	1.13	(4.09)
FATHER'S EDUCATION	-0.05	(-1.62)	-0.05	(-2.23)
MOTHER'S EDUCATION	-0.01	(-0.72)	-0.03	(-1.71)
HIGH SCHOOL GPA	0.35	(6.00)	0.14	(3.36)
GPA MISSING	-0.09	(-0.67)	-0.12	(-1.23)
R-SQUARED	.29		.13	
F-STATISTIC	17.69		3.97	
N	835		541	

NOTE: THE NUMBERS IN PARENTHESES ARE T-STATISTICS; VALUES GREATER THAN APPROXIMATELY 1.65 ARE STATISTICALLY SIGNIFICANT AT THE .10 LEVEL.

TABLE 4-8

DETERMINANTS OF MONTHS OF LABOR MARKET EXPERIENCE

(OLS ESTIMATES FOR EQUATION (6))

WHITE MEN

VARIABLE	FULL SAMPLE		12 YEARS EDUCATION		NOT ENROLLED SINCE 1977	
INTERCEPT	-77.74	(10.37)	-88.27	(-0.00)	-88.83	(-5.54)
CONCENTRATOR	1.03	(0.54)	1.35	(0.67)	2.98	(1.18)
LIMIT CONCENTRATOR	2.21	(1.24)	1.08	(0.57)	3.29	(1.47)
CONCENTRATOR/EXPLOR	2.56	(1.14)	1.29	(0.52)	3.57	(1.23)
EXPLORER	-0.76	(-0.22)	-0.31	(-0.08)	0.37	(0.07)
INCIDENTAL/PERSONAL	1.06	(0.71)	1.32	(0.79)	2.81	(1.45)
INCOMP. TRANSCRIPT	-3.46	(-2.53)	-4.41	(-2.91)	-3.95	(-2.25)
SOCIOECONOMIC SCALE	-0.01	(-0.19)	0.11	(1.69)	0.16	(2.01)
RURAL RESIDENCE	0.44	(0.44)	2.20	(2.08)	0.49	(0.39)
AGE	5.78	(18.28)	5.63	(17.58)	5.85	(12.36)
YEARS OF EDUCATION	-1.14	(-2.32)	-----		-0.33	(-0.28)
R-SQUARED	.31		.34		.26	
F-STATISTIC	36.64		34.18		18.63	
	834		686		541	

NOTE: THE NUMBERS IN PARENTHESES ARE T-STATISTICS; VALUES GREATER THAN APPROXIMATELY 1.65 ARE STATISTICALLY SIGNIFICANT AT THE .10 LEVEL.

TABLE 4-9

DETERMINANTS OF MONTHS OF TENURE WITH CURRENT EMPLOYER

(OLS ESTIMATES FOR EQUATION (5))

WHITE MEN

VARIABLE	FULL SAMPLE		12 YEARS EDUCATION		NOT ENROLLED SINCE 1977	
INTERCEPT	0.3706	(0.14)	0.2130	(0.07)	1.2090	(0.30)
CONCENTRATOR	0.0797	(0.02)	-1.4023	(-0.39)	0.8957	(0.20)
LIMIT CONCENTRATOR	-0.2994	(-0.10)	0.2161	(0.07)	0.0476	(0.01)
CONCENTRATOR/EXPLOR	4.7927	(1.45)	6.1165	(1.65)	4.3175	(1.00)
EXPLORER	17.3036	(3.72)	18.8556	(3.79)	13.5015	(2.04)
INCIDENTAL/PERSONAL	-0.3243	(-0.15)	0.9395	(0.40)	0.1217	(0.04)
INCOMP. TRANSCRIPT	-2.9603	(-1.59)	-3.2904	(-1.57)	-2.8623	(-1.18)
AGRIC. SPECIALTY	-1.5059	(-0.48)	-3.0105	(-0.91)	-0.1785	(-0.04)
T&I SPECIALTY	2.7856	(1.18)	2.7744	(1.10)	2.5678	(0.82)
SOCIOECONOMIC SCALE	-0.1084	(-1.31)	-0.0444	(-0.46)	-0.0590	(-0.51)
MONTHS EXPERIENCE	0.6642	(4.35)	0.7216	(4.35)	0.6920	(3.04)
SQ OF MTHS EXPER	-0.0037	(-1.58)	-0.0047	(-1.80)	-0.0042	(-1.27)
FARM WORK	42.1575	(10.03)	48.3335	(10.94)	34.7920	(5.85)
R-SQUARED	.26		.31		.20	
F-STATISTIC	23.44		24.52		19.86	
N	828		680		536	

NOTE: THE NUMBERS IN PARENTHESES ARE T-STATISTICS; VALUES GREATER THAN APPROXIMATELY 1.65 ARE STATISTICALLY SIGNIFICANT AT THE .10 LEVEL.

TABLE 4-10

DETERMINANTS OF PROBABILITY OF BEING IN SPECIFIC OCCUPATIONS
(PROBIT ESTIMATES)
MEN (N = 1266)

Variable / Occupation Equation	Professional (3.1)		Manager (3.2)		Sales (3.3)		Clerical (3.4)	
CONCENTRATOR	.0043	(.24)	-.0108	(1.03)	.0042	(.92)	.0125	(.39)
LIMITED CONCENTRATOR	.0114	(.75)	-.0142	(1.49)	-.0034	(.66)	.0267	(.96)
CONCENTRATOR/EXPLORER	-.0069	(.30)	-.0213	(1.56)	.0035	(.71)	.0491	(1.49)
EXPLORER	.0458	(1.78)	-.1295	(1.55)	.0080	(1.06)	-.3640	(.24)
INCIDENTAL/PERSONAL	-.0009	(.07)	-.0093	(1.27)	.0026	(.70)	.0307	(1.32)
INCOMPLETE TRANSCRIPT	.0006	(.05)	-.0106	(1.61)	-.0006	(.19)	.0262	(1.26)
AGRICULTURE SPECIALTY	.0047	(.24)	-.0025	(.19)	-.0035	(.54)	-.0660	(1.54)
YEARS OF EDUCATION	.0240	(8.38)	-.0018	(.71)	.0016	(1.56)	.0131	(2.02)
BLACK	.0068	(.65)	-.0115	(1.48)	-.0035	(1.09)	.0296	(1.71)
HISPANIC	-.0045	(.30)	.0022	(.27)	.0015	(.45)	.0167	(.74)
FATHER: PROFESSIONAL	.0251	(.78)	.0072	(.47)	.0350	(.10)	.0320	(.74)
FATHER: MANAGER	.0179	(.57)	.0096	(.68)	.0472	(.13)	-.0346	(.78)
FATHER: SALES	.0073	(.20)	.0303	(1.96)	-.0030	(.01)	.0620	(1.32)
FATHER: CLERICAL	.0208	(.59)	-.1113	(.19)	.0474	(.13)	.0277	(.58)
FATHER: CRAFTS	.0091	(.29)	-.0008	(.06)	.0459	(.13)	.0185	(.50)
FATHER: OPERATIVE	.0219	(.72)	-.0031	(.23)	.0449	(.13)	.0266	(.72)
FATHER: FARMER	-.0010	(.02)	-.0080	(.37)	.0003	(.00)	-.0328	(.46)
FATHER: FARM WORK	.0624	(1.75)	-.1066	(.14)	-.0000	(.00)	-.3669	(.26)
FATHER: SERVICE	.0594	(1.88)	-.1123	(.23)	.0416	(.12)	-.0087	(.19)
MOTHER: PROFESSIONAL	.1497	(.12)	-.0298	(1.21)	-.0152	(1.63)	-.1796	(2.79)
MOTHER: MANAGER	.1467	(.12)	.0099	(.41)	-.0076	(.78)	-.0999	(1.43)
MOTHER: SALES	.1423	(.11)	-.0013	(.05)	-.0625	(.13)	-.1154	(1.74)
MOTHER: CLERICAL	.1558	(.12)	-.0142	(.64)	-.0126	(1.43)	-.1432	(2.39)
MOTHER: CRAFTS	.0163	(.01)	-.1245	(.10)	-.0563	(.06)	-.5505	(.24)
MOTHER: OPERATIVE	.1349	(.11)	-.0048	(.21)	-.0159	(1.70)	-.1467	(2.38)
MOTHER: FARM WORK	.0086	(.01)	-.1101	(.11)	-.0539	(.08)	-.0855	(.91)
MOTHER: SERVICE	.1352	(.11)	-.0153	(.67)	-.0170	(1.84)	-.1474	(2.44)
MOTHER: HH SERVICE	.1467	(.12)	-.1172	(.18)	-.0574	(.12)	-.0933	(1.40)
SOCIOECONOMIC STATUS	.0012	(1.82)	.0003	(.72)	.0003	(1.68)	.0014	(1.26)
NORTH EAST	.0088	(.77)	-.0018	(.25)	.0005	(.13)	.0499	(2.68)
WEST	-.0032	(.27)	-.0047	(.66)	.0077	(2.46)	-.0063	(.30)
SOUTH	.0024	(.23)	-.0014	(.23)	.0041	(1.35)	-.0097	(.53)
MONTHS EXPERIENCE	.0002	(.89)	.0004	(2.92)	-.0000	(.67)	-.0004	(.90)
FATH OCC MISSING	.0077	(.25)	.0050	(.38)	.0441	(.12)	.0273	(.76)
MOTH OCC MISSING	.1495	(.12)	-.0159	(.74)	-.0143	(1.67)	-.1612	(2.78)
CONSTANT	-.5729	(.45)	-.0237	(.61)	-.0762	(.21)	-.2212	(2.19)
X^2 (SIGNIFICANCE)	136.56	(.00)	61.69	(.01)	46.11	(.10)	62.54	(.01)

TABLE 4-10
(Continued)

Variable / Occupation Equation	Craft (3.5)		Operative (3.6)		Laborer (3.7)		Farm Work (3.9)		Service (3.10)	
CONCENTRATOR	.1015	(2.02)	-.0359	(.63)	-.0361	(.87)	.0007	(.65)	-.0520	(1.58)
LIMITED CONCENTRATOR	.0853	(1.84)	-.0270	(.51)	-.0103	(.27)	-.0005	(.38)	-.0339	(1.18)
CONCENTRATOR/EXPLORER	.1101	(1.99)	-.0152	(.24)	-.0082	(.18)	-.0009	(.57)	-.0694	(1.76)
EXPLORER	-.2073	(1.52)	.0642	(.63)	-.0049	(.62)	.0027	(1.89)	.0358	(.70)
INCIDENTAL/PERSONAL	.0159	(.39)	.0068	(.15)	.0012	(.39)	-.0009	(.74)	-.0379	(1.64)
INCOMPLETE TRANSCRIPT	.0465	(1.26)	-.0323	(.80)	-.0201	(.70)	.0003	(.29)	-.0214	(1.09)
AGRICULTURE SPECIALTY	-.0813	(1.47)	.0603	(1.01)	.0483	(1.21)	.0027	(3.15)	-.0958	(1.77)
YEARS OF EDUCATION	-.0289	(2.10)	-.0650	(3.81)	-.0324	(2.47)	-.0002	(.57)	-.0025	(.32)
BLACK	-.2146	(5.70)	.0382	(1.10)	.0233	(.95)	-.0015	(1.36)	.0810	(4.77)
HISPANIC	-.0400	(1.06)	.0007	(.02)	.0150	(.48)	.0003	(.36)	.0151	(.65)
FATHER: PROFESSIONAL	.0328	(.45)	.0066	(.08)	-.0715	(1.25)	.0003	(.18)	-.0530	(1.18)
FATHER: MANAGER	.0069	(.10)	.0188	(.25)	-.0574	(1.14)	.0007	(.40)	.0075	(.20)
FATHER: SALES	.0111	(.14)	-.0506	(.51)	-.0502	(.79)	-.0075	(.08)	-.1129	(1.69)
FATHER: CLERICAL	.0226	(.28)	-.0197	(.21)	-.0443	(.72)	-.0075	(.09)	.0048	(.11)
FATHER: CRAFTS	.0736	(1.24)	-.0130	(.20)	-.0562	(1.31)	-.0000	(.01)	-.0526	(1.49)
FATHER: OPERATIVE	-.0093	(.15)	.0784	(1.20)	-.0928	(2.14)	-.0011	(.68)	-.0487	(1.38)
FATHER: FARMER	-.0239	(.27)	-.1624	(1.53)	.0021	(.03)	.0044	(2.86)	.0009	(.02)
FATHER: FARM WORK	.0451	(.46)	-.1796	(1.43)	-.0492	(.62)	.0035	(2.19)	.0170	(.29)
FATHER: SERVICE	.1080	(1.53)	-.0028	(.03)	-.0742	(1.37)	-.0080	(.11)	-.0325	(.77)
MOTHER: PROFESSIONAL	.1595	(1.03)	.0718	(.43)	.4922	(.38)	.0065	(.03)	.4312	(.17)
MOTHER: MANAGER	.1374	(.82)	-.1403	(.73)	.5467	(.42)	-.0012	(.00)	.3250	(.12)
MOTHER: SALES	.1212	(.75)	.0435	(.25)	.4656	(.36)	-.0058	(.02)	.3568	(.14)
MOTHER: CLERICAL	.1554	(1.03)	-.0186	(.12)	.5390	(.41)	.0051	(.02)	.3671	(.14)
MOTHER: CRAFTS	-.0031	(.02)	.3751	(1.79)	.5116	(.39)	-.0003	(.00)	-.0303	(.01)
MOTHER: OPERATIVE	.0363	(.24)	.1654	(1.02)	.4909	(.38)	.0076	(.03)	.3535	(.14)
MOTHER: FARM WORK	.0709	(.37)	.1136	(.56)	.4204	(.32)	.0069	(.03)	-.0650	(.00)
MOTHER: SERVICE	.0912	(.60)	.0419	(.26)	.5792	(.44)	.0063	(.03)	.4137	(.16)
MOTHER: HH SERVICE	.2375	(1.45)	-.0242	(.14)	.4587	(.35)	.0005	(.00)	.3924	(.15)
SOCIOECONOMIC STATUS	-.0018	(1.02)	-.0028	(1.39)	-.0015	(1.08)	.0000	(.08)	.0006	(.56)
NORTH EAST	-.0331	(.95)	-.0447	(1.16)	-.0455	(1.61)	.0012	(1.43)	.0281	(1.31)
WEST	.0133	(.40)	-.0580	(1.50)	-.0476	(1.70)	.0005	(.55)	.0584	(2.80)
SOUTH	.0347	(1.16)	-.0527	(1.56)	-.0016	(.07)	.0001	(.14)	.0090	(.46)
MONTHS EXPERIENCE	.0014	(1.88)	.0020	(2.30)	-.0014	(2.20)	-.0000	(.74)	-.0004	(.80)
FATH OCC MISSING	-.0379	(.64)	.0296	(.46)	-.0670	(1.62)	.0006	(.41)	-.0038	(.12)
MOTH OCC MISSING	.1115	(.75)	.0303	(.19)	.5575	(.43)	.0077	(.03)	.3897	(.15)
CONSTANT	-.0426	(.19)	.5330	(2.03)	-.2510	(.19)	-.0108	(.05)	-.5087	(.20)
χ^2 (SIGNIFICANCE)	97.63	(.01)	80.77	(.01)	49.37	(.06)	100.05	(.00)	91.17	(.00)

NOTE: Dependent variable is defined on a scale from zero to unity. Estimates presented are not the probit coefficients but are a constant multiple of those coefficients and show the partial derivatives of the predicted probability evaluated at the means of the explanatory variables. Except where noted, numbers in parentheses are ratios of estimated coefficients to their estimated standard errors; values greater than approximately 1.65 are statistically significant at the .10 level.

TABLE 4-11

DETERMINANTS OF PROBABILITY OF BEING IN UNIONIZED JOB
(PROBIT ESTIMATES FOR EQUATION (4))
MEN

	White			Minority		
	Full Sample	Exactly 12 Years Education	Not Enrolled Since 1977	Full Sample	Exactly 12 Years Education	Not Enrolled Since 1977
CONCENTRATOR	-.1845 (2.02)	-.2711 (2.61)	-.2892 (2.25)	-.1312 (.97)	-.2127 (1.38)	-.2422 (1.31)
LIMITED CONCENTRATOR	-.0825 (1.13)	-.1749 (2.02)	-.1453 (1.51)	-.1167 (.93)	-.0860 (.64)	-.2451 (1.53)
CONCENTRATOR/EXPLORER	-.1080 (1.23)	-.1834 (1.75)	-.0810 (.71)	-.0280 (.21)	.0247 (.17)	-.2252 (1.13)
EXPLORER	-.0009 (.01)	-.0715 (.50)	.1202 (.69)	-.0131 (.04)	.0306 (.09)	.0272 (.06)
INCIDENTAL/PERSONAL	.0168 (.32)	-.0234 (.37)	.0067 (.10)	-.0271 (.28)	-.0189 (.17)	-.0870 (.67)
INCOMPLETE TRANSCRIPT	-.0466 (.97)	-.0766 (1.33)	-.0993 (1.54)	-.0181 (.23)	-.0004 (.00)	-.0393 (.36)
AGRICULTURE SPECIALTY	-.0033 (.04)	.0434 (.46)	.0191 (.17)	-.0974 (.71)	-.0181 (.12)	-.1265 (.58)
T&I SPECIALTY	.0712 (1.15)	.1170 (1.64)	.0644 (.77)	.0346 (.37)	.0420 (.41)	.1246 (1.01)
PROFESSIONAL	-.2604 (3.24)	-.3919 (2.76)	-.4069 (3.05)	-.3408 (2.14)	-1.4283 (.22)	-.4396 (1.67)
MANAGER	-.2547 (3.37)	-.2560 (2.99)	-.3230 (3.30)	-.1360 (.90)	-.2231 (1.20)	-.0687 (.35)
SALES	-.2540 (2.44)	-.1969 (1.59)	-.2818 (1.76)	-1.4565 (.33)	-1.486 (.21)	-1.6438 (.24)
CLERICAL	-.2719 (3.82)	-.2862 (3.35)	-.3303 (3.47)	-.2212 (2.17)	-.2074 (1.90)	-.3191 (2.17)
CRAFT	-.1869 (3.69)	-.2100 (3.64)	-.2344 (3.39)	-.0158 (.17)	-.0228 (.23)	-.1225 (.97)
OPERATIVE	-.0089 (.19)	-.0193 (.36)	-.0339 (.51)	.0299 (.39)	.0306 (.39)	-.0422 (.39)
FARM	-1.2186 (.46)	-1.3299 (.46)	-1.4280 (.41)	-.0788 (.42)	-.0437 (.23)	-1.3347 (.18)
SERVICE	-.1600 (2.29)	-.1554 (1.95)	-.1569 (1.59)	-.1504 (1.70)	-.1508 (1.61)	-.3159 (2.49)
SOCIOECONOMIC STATUS	-.0008 (.38)	.0004 (.16)	.0008 (.26)	-.0027 (.89)	-.0021 (.64)	.0005 (.12)
NORTHEAST	-.0453 (1.07)	-.0436 (.89)	-.0613 (1.08)	-.1265 (1.37)	-.1923 (1.89)	-.0582 (.45)
WEST	-.1547 (3.30)	-.1385 (2.61)	-.2100 (3.21)	-.2299 (2.65)	-.2044 (2.23)	-.2638 (2.30)
SOUTH	-.1581 (3.95)	-.1786 (3.77)	-.1912 (3.52)	-.2060 (2.73)	-.2301 (2.89)	-.2709 (2.62)
MONTHS EXPERIENCE	.0028 (2.66)	.0038 (3.07)	.0027 (1.92)	.0059 (3.32)	-.0051 (2.73)	.0060 (2.47)
HISPANIC	--	--	--	-.1247 (2.00)	-.1517 (2.24)	-.1522 (1.83)
CONSTANT	-.0363 (.58)	-.0108 (.15)	.0641 (.76)	.0265 (.24)	.0546 (.46)	.2067 (1.30)
x^2 (SIGNIFICANCE)	108.28 (.00)	94.45 (.00)	89.42 (.00)	54.75 (.00)	53.07 (.00)	40.38 (.01)
N	773	633	507	386	311	224

NOTE: Dependent variable is defined on a scale from zero to unity. Estimates presented are not the probit coefficients but are a constant multiple of those coefficients and show the partial derivatives of the predicted probability evaluated at the means of the explanatory variables. Except where noted, numbers in parentheses are ratios of estimated coefficients to their estimated standard errors; values greater than approximately 1.65 are statistically significant at the .10 level.

TABLE 4-12

DETERMINANTS OF PROBABILITY OF BEING IN SPECIFIC INDUSTRIES
(PROBIT ESTIMATES)
MEN (N = 1266)

Variable / Industry Equation	Agriculture (2.1)	Mining (2.2)	Construction (2.3)	Manufacturing (2.4)	Transport (2.5)	Trade (2.6)
CONCENTRATOR	-.0012 (1.10)	-.0000 (.64)	.0318 (1.37)	.0153 (.27)	.0085 (.45)	.0246 (.45)
LIMITED CONCENTRATOR	-.0004 (.43)	.0000 (.50)	.0526 (2.61)	-.0350 (.69)	.0031 (.18)	-.0891 (1.74)
CONCENTRATOR/EXPLORER	-.0020 (1.30)	.0000 (.32)	.0499 (2.12)	-.1682 (2.54)	-.0135 (.58)	.0766 (1.31)
EXPLORER	.0008 (.55)	-.0002 (.03)	.0605 (1.59)	-.0238 (.21)	.0185 (.50)	-.1243 (.99)
INCIDENTAL/PERSONAL	-.0002 (.20)	-.0000 (.82)	.0522 (2.89)	-.0654 (1.47)	-.0091 (.58)	-.0313 (.75)
INCOMPLETE TRANSCRIPT	-.0007 (.88)	-.0000 (.23)	.0226 (1.31)	-.0185 (.47)	.0039 (.29)	-.0395 (1.07)
AGRICULTURE SPECIALTY	.0029 (3.86)	.0001 (2.44)	-.0288 (1.28)	.0524 (.90)	-.0091 (.43)	-.1417 (2.03)
PROFESSIONAL	.0011 (1.34)	.0000 (.91)	-.0736 (2.68)	.1449 (2.29)	-.0098 (.47)	-.3305 (2.86)
MANAGER	-.0070 (.14)	-.0002 (.05)	-.3157 (.34)	-.2837 (2.93)	-.2303 (.25)	.5143 (8.55)
SALES	-.0071 (.11)	-.0002 (.04)	-.3259 (.27)	-.2418 (1.92)	-.2360 (.20)	.5868 (7.02)
CLERICAL	-.0009 (1.00)	-.0002 (.07)	-.0757 (3.44)	-.0112 (.21)	-.0119 (.73)	.1477 (3.34)
CRAFT	-.0014 (2.07)	.0000 (.69)	.0262 (2.20)	.1590 (4.00)	.0054 (.43)	-.1011 (2.52)
OPERATIVE	-.0026 (2.95)	.0001 (2.18)	-.0395 (3.11)	.3429 (9.27)	-.0075 (.62)	-.0182 (.51)
FARM	.0069 (7.04)	-.0002 (.04)	-.3151 (.23)	-1.0571 (.50)	-.0177 (.53)	-.9803 (.45)
SERVICE	-.0071 (.21)	-.0002 (.07)	-.1266 (3.62)	-.2749 (3.78)	-.0387 (2.10)	.1788 (4.16)
BLACK	-.0028 (2.21)	-.0003 (.17)	-.0100 (.75)	.0658 (1.93)	.0252 (2.42)	-.0940 (2.86)
HISPANIC	-.0003 (.44)	-.0000 (1.29)	-.0137 (.85)	.1018 (2.44)	-.0095 (.62)	-.0142 (.36)
YEARS OF EDUCATION	-.0007 (1.40)	.0000 (.09)	.0037 (.63)	.0008 (.05)	.0024 (.50)	-.0246 (1.57)
SOCIOECONOMIC STATUS	-.0001 (2.27)	-.0000 (.81)	.0108 (1.72)	-.0025 (1.47)	.0010 (1.74)	.0000 (.02)
NORTH EAST	.0006 (.82)	-.0000 (.16)	-.0296 (1.96)	-.0667 (1.83)	.0200 (1.47)	.0060 (.16)
WEST	.0008 (1.04)	.0000 (1.06)	.0001 (.01)	-.1839 (4.75)	.0298 (2.24)	.0407 (1.14)
SOUTH	.0004 (.58)	.0001 (2.73)	-.0105 (.90)	-.1721 (5.21)	.0275 (2.33)	.0557 (1.75)
MONTHS EXPERIENCE	-.0000 (.67)	.0000 (.86)	-.0006 (1.68)	.0021 (2.39)	-.0000 (.09)	.0010 (1.16)
CONSTANT	.0047 (.80)	-.0002 (1.64)	-.1360 (1.83)	-.2471 (1.31)	.1528 (2.57)	.0613 (.31)
x^2 (SIGNIFICANCE)	250.37 (.00)	60.75 (.00)	145.90 (.00)	345.31 (.00)	395.56 (.02)	306.84 (.00)

TABLE 4-12
(Continued)

Variable / Industry Equation	Finance (2.7)	Business Services (2.8)	Personal Services (2.9)	Entertainment (2.10)	Professional Service (2.11)	Public Administration (2.12)
CONCENTRATOR	.0006 (.82)	-.0072 (.88)	.0001 (.38)	-.0007 (.09)	-.0101 (.87)	-.0071 (1.04)
LIMITED CONCENTRATOR	.0005 (.85)	-.0007 (.11)	.0001 (.56)	-.0001 (.58)	-.0017 (.18)	-.0094 (1.37)
CONCENTRATOR/EXPLORER	.0001 (.13)	.0085 (1.11)	-.0010 (.07)	-.0006 (.06)	-.0026 (.21)	.0003 (.05)
EXPLORER	-.0034 (.05)	-.0926 (.10)	-.0011 (.05)	-.0007 (.04)	-.0008 (.04)	.0059 (.68)
INCIDENTAL/PERSONAL	.0003 (.69)	.0008 (.13)	.0001 (.70)	-.0000 (.32)	-.0082 (1.06)	.0057 (1.48)
INCOMPLETE TRANSCRIPT	.0006 (1.34)	.0003 (.06)	.0002 (1.35)	.0000 (.44)	-.0059 (.90)	-.0039 (1.01)
AGRICULTURE SPECIALTY	-.0042 (.12)	.0003 (.04)	-.0009 (.06)	-.0006 (.06)	-.0096 (.52)	.0051 (.96)
PROFESSIONAL	-.0002 (.25)	.1051 (.34)	-.0010 (.05)	.0002 (2.78)	.0297 (3.04)	.0057 (1.32)
MANAGER	.0002 (.34)	.0943 (.31)	.0002 (1.06)	-.0000 (.23)	-.0005 (.04)	-.0464 (.19)
SALES	.0012 (2.10)	-.0003 (.00)	-.0009 (.04)	-.0006 (.04)	-.0781 (.23)	-.0467 (.15)
CLERICAL	.0016 (3.52)	.0836 (.27)	.0002 (1.14)	-.0001 (.68)	.0284 (3.43)	.0008 (.22)
CRAFT	-.0004 (.69)	.1110 (.36)	-.0009 (.10)	-.0007 (.11)	-.0040 (.41)	-.0142 (2.45)
OPERATIVE	-.0038 (.22)	.0913 (1.33)	.0001 (.77)	-.0001 (1.76)	-.0221 (1.77)	-.0166 (3.15)
FARM	-.0036 (.07)	.0022 (.00)	-.0009 (.04)	-.0006 (.04)	-.0701 (.18)	-.0010 (.14)
SERVICE	-.0008 (1.57)	.0991 (.32)	.0005 (3.55)	-.0000 (.02)	.0414 (5.31)	.0001 (.03)
BLACK	.0003 (.84)	-.0053 (1.09)	.0000 (1.67)	.0000 (.73)	.0085 (1.54)	.0060 (1.98)
HISPANIC	-.0000 (.04)	-.0052 (.94)	.0000 (.34)	.0000 (.35)	.0007 (.08)	.0042 (1.04)
YEARS OF EDUCATION	.0001 (.60)	-.0043 (1.89)	-.0000 (.44)	-.0001 (1.89)	.0079 (3.91)	.0000 (.01)
SOCIOECONOMIC STATUS	.0000 (1.92)	.0001 (.51)	.0000 (.01)	-.0000 (.07)	-.0005 (1.77)	.0000 (.23)
NORTH EAST	.0004 (1.08)	.0039 (.74)	.0003 (1.84)	-.0001 (1.03)	-.0039 (.55)	.0080 (2.01)
WEST	-.0000 (.12)	.0135 (2.79)	.0003 (2.05)	-.0001 (1.34)	-.0103 (1.30)	.0030 (.71)
SOUTH	-.0008 (1.83)	.0070 (1.56)	.0002 (1.60)	-.0001 (1.42)	.0043 (.72)	.0063 (1.75)
MONTHS EXPERIENCE	.0000 (.07)	-.0001 (1.18)	-.0000 (.79)	.0000 (.41)	-.0000 (.10)	.0000 (.29)
CONSTANT	-.0044 (2.81)	-.0847 (.27)	-.0009 (1.49)	.0003 (.89)	-.1609 (6.11)	-.0308 (2.03)
x^2 (SIGNIFICANCE)	80.09 (.01)	105.35 (.01)	68.02 (.01)	36.20 (.04)	160.98 (.00)	70.23 (.01)

NOTE: Dependent variable is defined on a scale from zero to unity. Estimates presented are not the probit coefficients but are a constant multiple of those coefficients and show the partial derivatives of the predicted probability evaluated at the means of the explanatory variables. Except where noted, numbers in parentheses are ratios of estimated coefficients to their estimated standard errors; values greater than approximately 1.65 are statistically significant at the .10 level.

TABLE 4-13

DETERMINANTS OF (LOG) EARNINGS PER HOUR

(OLS ESTIMATES FOR EQUATION (1))

WHITE MEN

VARIABLE	FULL SAMPLE		12 YEARS EDUCATION		NOT ENROLLED SINCE 1977	
INTERCEPT	0.8502	(3.75)	1.2411	(0.00)	1.3979	(3.03)
CONCENTRATOR	-0.0826	(-1.07)	-0.1450	(-1.71)	-0.1155	(-1.20)
LIMIT CONCENTRATOR	-0.0284	(-0.43)	-0.0928	(-1.27)	-0.0940	(-1.21)
CONCENTRATOR/EXPLOR	-0.0335	(-0.44)	-0.0853	(-0.97)	-0.0701	(-0.77)
EXPLORER	-0.2472	(-2.17)	-0.3044	(-2.41)	0.0518	(0.36)
INCIDENTAL/PERSONAL	0.0065	(0.13)	-0.0544	(-0.96)	-0.0558	(-0.94)
INCORP. TRANSCRIPT	0.0083	(0.18)	-0.0665	(-1.29)	-0.0354	(-0.67)
AGRIC. SPECIALTY	0.0232	(0.32)	0.0085	(0.10)	-0.0295	(-0.33)
T&I SPECIALTY	-0.0167	(-0.30)	-0.0225	(-0.37)	-0.0222	(-0.33)
YEARS OF EDUCATION	0.0346	(2.25)	------		-0.0022	(-0.06)
SOCIOECONOMIC SCALE	0.0034	(1.70)	0.0030	(1.32)	0.0030	(1.23)
MONTHS TENURE	0.0083	(5.12)	0.0087	(4.97)	0.0080	(3.95)
SQ OF MONTHS TENURE	-.0001	(-5.47)	-.0000	(-5.39)	-.0000	(-2.81)
MONTHS EXPERIENCE	0.0096	(2.56)	0.0081	(1.94)	0.0101	(1.93)
SQ OF MTHS EXPER	-0.0001	(-1.99)	-.0000	(-1.35)	-0.0001	(-1.72)
NORTHEAST	-0.0557	(-1.41)	-0.0642	(-1.48)	-0.0705	(-1.49)
SOUTH	-0.0535	(-1.46)	-0.0316	(-0.78)	-0.0502	(-1.12)
WEST	0.1138	(2.77)	0.1185	(2.55)	0.1609	(3.08)
AGRICULTURE	-0.3048	(-2.20)	-0.1887	(-1.28)	-0.4382	(-2.45)
MINING	0.2950	(1.97)	0.3870	(2.46)	0.2689	(1.56)
CONSTRUCTION	0.2175	(1.81)	0.3478	(2.73)	0.1958	(1.32)
MANUFACTURING	0.1431	(1.22)	0.2258	(1.83)	0.1077	(0.74)
TRANSPORTATION	0.1024	(0.79)	0.1920	(1.39)	0.0424	(0.27)
TRADE	-0.1147	(-0.98)	.0000	(0.00)	-0.1391	(-0.96)
FINANCE	0.0236	(0.16)	0.0626	(0.40)	0.0032	(0.01)
BUSINESS SERVICE	-0.0525	(-0.42)	0.0150	(0.11)	-0.1194	(-0.79)
ENTERTAINMENT/REC	-0.1836	(-1.04)	-0.0821	(-0.44)	-0.1831	(-0.83)
PROF. SERVICE	0.0324	(0.24)	0.1154	(0.74)	-0.0618	(-0.36)
PUBLIC ADMIN.	-0.1972	(-1.28)	-0.0595	(-0.31)	-0.0047	(-0.02)
UNIONIZED JOB	0.2123	(6.33)	0.2144	(5.97)	0.1753	(4.46)
R-SQUARED	.30		.32		.28	
F-STATISTIC	10.90		9.73		6.39	
N	758		618		497	

NOTE: THE NUMBERS IN PARENTHESES ARE T-STATISTICS; VALUES GREATER THAN APPROXIMATELY 1.65 ARE STATISTICALLY SIGNIFICANT AT THE .10 LEVEL.

TABLE 4-14

SUMMARY OF DIRECT, INDIRECT, AND TOTAL EFFECTS ON HOURLY EARNINGS
WHITE MEN
(PERCENT)

	Concentrators	Limited Concentrators	Concentrator/ Explorers	Agriculture Specialists	T&I Specialists
Direct	-8.3	-2.8	-3.4	2.3	-1.7
Indirect, through:	-1.9	2.6	1.1	2.5	2.3
Education	.5	.3	.6	-.1	-.7
Tenure	.4	.7	3.2	-.8	1.6
Experience	.9	.9	.9	-	-
Agriculture	-	-	-	-.1	-
Mining	-	-	-	-	-
Construction	-.3	1.4	1.4	-.3	-
Manufacturing	.5	-.2	-1.8	1.6	-
Transportation	1.3	.1	-.1	-	-
Trade	-	1.3	-.6	2.1	-.1
Finance	-	-	-	-	-
Business Services	-	-	-	-	-
Entertainment	-	-	-	-	-
Professional Services	-	-	-	-	-
Public Administration	.1	.2	-	-	-
Unionization	-4.2	-2.0	-2.5	.2	1.5
TOTAL	-10.1	-.2	-2.3	4.8	.6

NOTE: Components may not add to totals because of rounding. A - indicates an effect less than .1.

TABLE 4-15

DETERMINANTS OF YEARS OF EDUCATION

(OLS ESTIMATES FOR EQUATION (7))

MINORITY MEN

VARIABLE	FULL SAMPLE		NOT ENROLLED SINCE 1977	
INTERCEPT	10.29	(11.99)	12.09	(18.95)
CONCENTRATOR	0.30	(1.40)	0.44	(2.79)
LIMIT CONCENTRATOR	0.28	(1.41)	0.19	(1.40)
CONCENTRATOR/EXPLOR	0.17	(0.79)	0.10	(0.62)
EXPLORER	-0.34	(-0.87)	-0.33	(-1.31)
INCIDENTAL/PERSONAL	0.19	(1.24)	0.15	(1.32)
INCOMP. TRANSCRIPT	-0.13	(-0.41)	-0.18	(-0.83)
AGRIC. SPECIALTY	-0.44	(-1.99)	-0.11	(-0.67)
T&I SPECIALTY	-0.41	(-2.65)	-0.28	(-2.60)
SOCIOECONOMIC SCALE	0.01	(0.59)	0.01	(0.70)
RURAL RESIDENCE	0.09	(0.71)	0.06	(0.69)
NORTHEAST	0.13	(0.90)	0.06	(0.55)
SOUTH	0.04	(0.39)	-0.14	(-1.65)
WEST	0.15	(1.15)	-0.08	(-0.84)
YEARS ED ASPIRED TO	0.13	(6.59)	0.04	(2.86)
ASPIR. DATA MISSING	1.41	(2.47)	0.34	(0.85)
FATHER'S EDUCATION	-0.03	(-0.80)	-0.02	(-1.01)
MOTHER'S EDUCATION	0.01	(0.67)	-0.01	(-0.53)
HIGH SCHOOL GPA	0.11	(1.17)	0.01	(-0.21)
GPA MISSING	0.35	(1.49)	0.11	(0.72)
R-SQUARED	.18		.13	
F-STATISTIC	4.69		1.85	
N	435		250	

NOTE: THE NUMBERS IN PARENTHESES ARE T-STATISTICS; VALUES GREATER THAN APPROXIMATELY 1.65 ARE STATISTICALLY SIGNIFICANT AT THE .10 LEVEL.

TABLE 4-16

DETERMINANTS OF MONTHS OF LABOR MARKET EXPERIENCE

(OLS ESTIMATES FOR EQUATION (6))

MINORITY MEN

VARIABLE	FULL SAMPLE		12 YEARS EDUCATION		NOT ENROLLED SINCE 1977	
INTERCEPT	-76.74	(-7.48)	-97.69	(0.00)	-65.81	(-2.80)
CONCENTRATOR	-0.91	(-0.34)	-1.38	(-0.47)	-0.05	(-0.01)
LIMIT CONCENTRATOR	2.37	(0.96)	2.49	(0.93)	1.36	(0.41)
CONCENTRATOR/EXPLOR	2.56	(0.90)	3.03	(1.00)	0.47	(0.11)
EXPLORER	-14.73	(-2.61)	-14.81	(-2.61)	-22.52	(-3.24)
INCIDENTAL/PERSONAL	-1.10	(-0.51)	-0.29	(-0.11)	-0.24	(-0.08)
INCOMP. TRANSCRIPT	-1.19	(-0.65)	-1.54	(-0.75)	-2.58	(-0.98)
HISPANIC	3.84	(3.07)	2.88	(2.06)	3.41	(1.88)
SOCIOECONOMIC SCALE	0.04	(0.67)	0.02	(0.29)	-0.04	(-0.41)
RURAL RESIDENCE	1.52	(0.86)	1.21	(0.64)	0.52	(0.21)
AGE	5.91	(13.59)	5.91	(12.85)	6.39	(8.93)
YEARS OF EDUCATION	-1.79	(-2.55)	———		-3.40	(1.87)
R-SQUARED	.34		.36		.30	
F-STATISTIC	19.70		17.26		9.15	
N	432		351		246	

NOTE: THE NUMBERS IN PARENTHESES ARE T-STATISTICS; VALUES GREATER THAN APPROXIMATELY 1.65 ARE STATISTICALLY SIGNIFICANT AT THE .10 LEVEL.

TABLE 4-17

DETERMINANTS OF MONTHS OF TENURE WITH CURRENT EMPLOYER

(OLS ESTIMATES FOR EQUATION (5))

MINORITY MEN

VARIABLE	FULL SAMPLE		12 YEARS EDUCATION		NOT ENROLLED SINCE 1977	
INTERCEPT	-0.0745	(-0.03)	-0.0587	(-0.02)	1.6607	(0.43)
CONCENTRATOR	9.3660	(2.99)	10.4780	(2.74)	13.2510	(2.83)
LIMIT CONCENTRATOR	4.0385	(1.40)	3.7251	(1.09)	3.9901	(0.99)
CONCENTRATOR/EXPLOR	4.0208	(1.26)	4.8263	(1.29)	5.7926	(1.16)
EXPLORER	13.2311	(2.33)	12.5463	(2.08)	0.3714	(0.05)
INCIDENTAL/PERSONAL	1.6487	(0.75)	2.1479	(0.79)	2.4161	(0.72)
INCOMP. TRANSCRIPT	-0.4394	(-0.24)	-0.6172	(-0.29)	-0.8873	(-0.32)
AGRIC. SPECIALTY	-4.6134	(-1.50)	-5.2175	(-1.47)	-1.9863	(-0.41)
T&I SPECIALTY	-5.8805	(-2.63)	-6.5455	(-2.42)	-8.0128	(-2.51)
HISPANIC	-1.6850	(-1.35)	-1.3275	(-0.90)	-1.7781	(-0.93)
SOCIOECONOMIC SCALE	-0.1355	(-1.96)	-0.1132	(-1.39)	-0.2464	(-2.38)
MONTHS EXPERIENCE	0.4164	(3.06)	0.4188	(2.67)	0.2253	(1.02)
SQ OF MTHS EXPER	0.0040	(1.77)	0.0045	(1.71)	0.0074	(2.16)
FARM WORK	0.6401	(0.16)	3.4802	(0.75)	-15.0292	(-1.72)
R-SQUARED	.41		.41		.42	
F-STATISTIC	22.32		17.89		13.11	
N	432		351		248	

NOTE: THE NUMBERS IN PARENTHESES ARE T-STATISTICS; VALUES GREATER THAN APPROXIMATELY 1.65 ARE STATISTICALLY SIGNIFICANT AT THE .10 LEVEL.

TABLE 4-18

DETERMINANTS OF (LOG) EARNINGS PER HOUR

(OLS ESTIMATES FOR EQUATION (1))

MINORITY MEN

VARIABLE	FULL SAMPLE		12 YEARS EDUCATION		NOT ENROLLED SINCE 1977	
INTERCEPT	0.4058	(1.38)	.9573	(-0.00)	0.1604	(0.22)
CONCENTRATOR	-0.0377	(-0.38)	-0.1084	(-0.92)	-0.0973	(-0.74)
LIMIT CONCENTRATOR	-0.1630	(-1.76)	-0.2215	(-2.08)	-0.2315	(-2.04)
CONCENTRATOR/EXPLOR	-0.1049	(-1.05)	-0.1197	(-1.04)	-0.0635	(-0.46)
EXPLORER	-0.7451	(-3.46)	-0.7644	(-3.46)	-0.3669	(-1.37)
INCIDENTAL/PERSONAL	0.0013	(0.01)	-0.0028	(-0.03)	-0.0037	(-0.04)
INCOMP. TRANSCRIPT	0.0060	(0.10)	-0.0004	(-0.00)	0.0381	(0.49)
AGRIC. SPECIALTY	0.0758	(0.77)	0.0947	(0.86)	-0.0093	(-0.06)
T&I SPECIALTY	0.0301	(0.43)	0.0762	(0.94)	0.0957	(1.10)
HISPANIC	0.0883	(1.95)	0.0455	(0.87)	0.0691	(1.15)
YEARS OF EDUCATION	0.0583	(2.68)	-----		0.0704	(1.30)
SOCIOECONOMIC SCALE	0.0053	(2.38)	0.0066	(2.62)	0.0106	(3.62)
MONTHS TENURE	0.0023	(0.68)	.0001	(0.01)	0.0074	(1.75)
SQ OF MONTHS TENURE	-.0001	(-1.60)	-.0000	(-0.85)	-0.0001	(-2.10)
MONTHS EXPERIENCE	0.0082	(1.68)	0.0098	(1.76)	0.0092	(1.27)
SQ OF MTHS EXPER	.0000	(0.11)	-.0000	(-0.10)	-.0000	(-0.21)
NORTHEAST	0.0169	(0.24)	-0.0236	(-0.30)	-0.0170	(-0.17)
SOUTH	-0.0732	(-1.25)	-0.1153	(-1.77)	-0.0580	(-0.77)
WEST	-0.0196	(-0.29)	-0.0035	(-0.04)	0.0458	(0.54)
AGRICULTURE	-0.0519	(-0.33)	0.1326	(0.71)	0.2493	(1.05)
MINING	0.8336	(2.97)	1.0625	(3.55)	0.9691	(3.27)
CONSTRUCTION	0.3312	(2.59)	0.6191	(3.91)	0.3734	(2.26)
MANUFACTURING	0.2944	(2.60)	0.4920	(3.43)	0.3667	(2.50)
TRANSPORTATION	0.3438	(2.71)	0.5574	(3.61)	0.3965	(2.49)
TRADE	0.0921	(0.80)	0.3079	(2.12)	0.1775	(1.18)
FINANCE	0.1515	(1.00)	0.2501	(1.23)	0.2662	(1.19)
BUSINESS SERVICE	0.0794	(0.59)	0.2532	(1.56)	0.0830	(0.47)
ENTERTAINMENT/REC	0.0695	(0.38)	0.2466	(1.22)	0.6655	(2.61)
PROF. SERVICE	0.0898	(0.70)	0.2386	(1.47)	0.0633	(0.38)
PUBLIC ADMIN.	0.1480	(1.05)	0.4131	(2.40)	0.3337	(1.73)
UNIONIZED JOB	0.1165	(2.84)	0.0992	(2.11)	0.0944	(1.75)
R-SQUARED	.33		.34		.33	
F-STATISTIC	5.63		4.82		3.15	
N	382		308		222	

NOTE: THE NUMBERS IN PARENTHESES ARE T-STATISTICS; VALUES GREATER THAN APPROXIMATELY 1.65 ARE STATISTICALLY SIGNIFICANT AT THE .10 LEVEL.

TABLE 4-19

SUMMARY OF DIRECT, INDIRECT, AND TOTAL EFFECTS ON HOURLY EARNINGS
MINORITY MEN
(PERCENT)

	Concentrators	Limited Concentrators	Concentrator/ Explorers	Agriculture Specialists	T&I Specialists
Direct	-3.8	-16.3	-10.5	7.6	3.0
Indirect, through:	.5	2.5	1.5	-3.1	-2.3
Education	1.7	1.6	1.0	-2.6	-2.4
Tenure	-.9	-.3	-.4	-.2	-.3
Experience	-.9	1.5	1.8	-	-
Agriculture	-	-	-	-	-
Mining	-	-	-	-	-
Construction	1.5	2.1	2.1	-.6	-
Manufacturing	.8	-.4	-3.8	2.8	-
Transportation	.5	.3	.2	-.2	-
Trade	-.1	-1.1	.5	-1.4	-
Finance	-	-	-	-	-
Business Services	-	-	.1	-.1	-
Entertainment	-	-	-	-	-
Professional Services	-.1	-	-	-.2	-
Public Administration	-.1	-.1	-	.1	-
Unionization	-1.7	-1.3	-.2	-.7	.4
TOTAL	-3.3	-13.8	-9.0	4.5	.7

NOTE: Components may not add to totals because of rounding. A - indicates an effect less than .1.

TABLE 4-20

DETERMINANTS OF YEARS OF EDUCATION

(OLS ESTIMATES FOR EQUATION (7))

WHITE WOMEN

VARIABLE	FULL SAMPLE		NOT ENROLLED SINCE 1977	
INTERCEPT	10.11	(13.21)	11.30	(16.17)
CONCENTRATOR	-0.94	(-5.06)	-0.51	(-2.72)
LIMIT CONCENTRATOR	-0.83	(-4.83)	-0.42	(-2.38)
CONCENTRATOR/EXPLOR	-0.68	(-3.66)	-0.20	(-1.05)
EXPLORER	-0.44	(-1.34)	-0.20	(-0.62)
INCIDENTAL/PERSONAL	-0.56	(-3.56)	-0.25	(-1.55)
INCOMP. TRANSCRIPT	0.29	(1.18)	0.33	(1.40)
HOME EC SPECIALTY	0.08	(0.25)	0.15	(0.50)
OFFICE SPECIALTY	0.17	(1.61)	0.09	(0.84)
SOCIOECONOMIC SCALE	0.06	(3.06)	0.04	(2.28)
RURAL RESIDENCE	-0.11	(-1.50)	-0.11	(-1.65)
NORTHEAST	0.34	(3.76)	0.13	(1.57)
SOUTH	0.32	(3.98)	0.12	(1.55)
WEST	-0.06	(-0.72)	-0.02	(-0.23)
YEARS ED ASPIRED TO	0.22	(12.87)	0.11	(7.06)
ASPIR. DATA MISSING	2.61	(5.38)	1.06	(1.91)
FATHER'S EDUCATION	-0.07	(-1.90)	-0.05	(-1.57)
MOTHER'S EDUCATION	-0.02	(-0.94)	-0.01	(-0.71)
HIGH SCHOOL GPA	0.33	(5.09)	0.18	(2.96)
GPA MISSING	-0.10	(-0.67)	-0.10	(-0.72)
R-SQUARED	.38		.19	
F-STATISTIC	26.68		6.76	
N	840		561	

NOTE: THE NUMBERS IN PARENTHESES ARE T-STATISTICS; VALUES GREATER THAN APPROXIMATELY 1.65 ARE STATISTICALLY SIGNIFICANT AT THE .10 LEVEL.

TABLE 4-21

DETERMINANTS OF MONTHS OF LABOR MARKET EXPERIENCE

(OLS ESTIMATES FOR EQUATION (6))

WHITE WOMEN

VARIABLE	FULL SAMPLE	12 YEARS EDUCATION	NOT ENROLLED SINCE 1977
INTERCEPT	-87.76 (12.75)	-89.29 (-0.00)	114.70 (10.10)
CONCENTRATOR	4.98 (2.52)	4.08 (1.60)	5.47 (2.05)
LIMIT CONCENTRATOR	4.91 (2.63)	3.48 (1.42)	4.80 (1.88)
CONCENTRATOR/EXPLOR	2.62 (1.30)	0.90 (0.34)	0.23 (0.08)
EXPLORER	7.23 (1.73)	2.93 (0.61)	5.88 (1.02)
INCIDENTAL/PERSONAL	1.53 (0 86)	-1.20 (-0.48)	1.07 (0.43)
INCOMP. TRANSCRIPT	0.34 (0 20)	-1.58 (-0.67)	-1.02 (-0.44)
SOCIOECONOMIC SCALE	0.00 (0.03)	-0.00 (-0.03)	0.05 (0.72)
RURAL RESIDENCE	-2.01 (-2.21)	-1.54 (-1.55)	-1.76 (-1.56)
AGE	5.87 (18.94)	5.59 (17.36)	6.40 (14.13)
YEARS OF EDUCATION	-0.71 (-1.71)	-----	0.70 (0.98)
R-SQUARED	.34	.35	.32
F-STATISTIC	41.82	32.30	25.39
N	839	618	560

NOTE: THE NUMBERS IN PARENTHESES ARE T-STATISTICS; VALUES GREATER THAN APPROXIMATELY 1.65 ARE STATISTICALLY SIGNIFICANT AT THE .10 LEVEL.

TABLE 4-22

DETERMINANTS OF MONTHS OF TENURE WITH CURRENT EMPLOYER

(OLS ESTIMATES FOR EQUATION (5))

WHITE WOMEN

VARIABLE	FULL SAMPLE		12 YEARS EDUCATION		NOT ENROLLED SINCE 1977	
INTERCEPT	0.0523	(0.02)	3.0470	(1.08)	2.0128	(0.64)
CONCENTRATOR	3.5377	(1.50)	0.4119	(0.13)	3.2246	(0.96)
LIMIT CONCENTRATOR	-0.0456	(-0.02)	-2.8418	(-0.97)	-1.8244	(-0.58)
CONCENTRATOR/EXPLOR	-0.0341	(-0.01)	-2.8695	(-0.91)	-0.8533	(-0.25)
EXPLORER	1.2621	(0.30)	-0.4505	(-0.08)	0.2624	(0.04)
INCIDENTAL/PERSONAL	0.6993	(0.35)	-2.3868	(-0.84)	-0.7704	(-0.26)
INCOMP. TRANSCRIPT	0.6623	(0.40)	-2.2618	(-0.91)	-0.8986	(-0.37)
HOME EC SPECIALTY	2.9645	(0.64)	2.3318	(0.45)	3.5097	(0.64)
OFFICE SPECIALTY	1.5539	(1.10)	1.8812	(1.15)	2.0433	(1.03)
SOCIOECONOMIC SCALE	-0.1698	(-3.14)	-0.1647	(-2.27)	-0.1562	(-1.98)
MONTHS EXPERIENCE	0.4635	(4.32)	0.3836	(3.03)	0.4630	(3.16)
SQ OF MTHS EXPER	-0.0015	(-0.90)	0.0013	(0.63)	-0.0015	(-0.69)
FARM WORK	-2.9248	(-0.43)	-2.4137	(-0.35)	-------	
R-SQUARED	.20		.25		.19	
F-STATISTIC	16.87		17.19		11.40	
N	837		616		559	

NOTE: THE NUMBERS IN PARENTHESES ARE T-STATISTICS; VALUES GREATER THAN APPROXIMATELY 1.65 ARE STATISTICALLY SIGNIFICANT AT THE .10 LEVEL.

TABLE 4-23

DETERMINANTS OF PROBABILITY OF BEING IN SPECIFIC OCCUPATIONS
(PROBIT ESTIMATES)
WOMEN (N = 1276)

Variable / Occupation Equation	Professional (3.1)		Manager (3.2)		Sales (3.3)		Clerical (3.4)	
CONCENTRATOR	-.0295	(1.62)	-.0051	(.66)	.0024	(.20)	.2314	(3.11)
LIMITED CONCENTRATOR	-.0034	(.32)	-.0125	(1.65)	.0004	(.03)	.1363	(2.00)
CONCENTRATOR/EXPLORER	-.0196	(1.48)	-.0118	(1.44)	.0017	(.14)	.0570	(.79)
EXPLORER	-.1314	(.15)	-.0829	(.11)	.0354	(2.07)	-.0534	(.37)
INCIDENTAL/PERSONAL	-.0004	(.04)	-.0079	(1.16)	-.0057	(.52)	.0465	(.70)
INCOMPLETE TRANSCRIPT	-.0058	(.64)	-.0184	(2.75)	-.0087	(.88)	.0793	(1.30)
HOME ECON SPECIALTY	.0061	(.29)	-.0696	(.11)	.0102	(.54)	-.3084	(2.62)
YEARS OF EDUCATION	.0207	(10.15)	-.0012	(.67)	.0026	(1.08)	-.0460	(3.09)
BLACK	.0074	(.93)	-.0037	(.62)	-.0263	(2.60)	.0425	(1.04)
HISPANIC	.0004	(.04)	-.0037	(.61)	-.0017	(.22)	.1468	(3.18)
FATHER: PROFESSIONAL	-.0111	(.80)	.0037	(.26)	-.0193	(1.19)	-.0008	(.01)
FATHER: MANAGER	-.0142	(1.13)	.0205	(1.66)	-.0053	(.39)	.0002	(.29)
FATHER: SALES	-.0347	(1.75)	-.0692	(.15)	-.0003	(.02)	.1016	(1.00)
FATHER: CLERICAL	-.0188	(1.16)	-.0008	(.05)	-.0059	(.35)	.0625	(.63)
FATHER: CRAFTS	-.0227	(2.00)	.0017	(.14)	-.0165	(1.31)	.0363	(.49)
FATHER: OPERATIVE	-.0246	(1.97)	.0113	(.93)	-.0112	(.87)	-.0578	(.75)
FATHER: FARMER	-.0201	(1.13)	.0154	(1.05)	-.0049	(.30)	.0429	(.39)
FATHER: FARM WORK	-.1375	(.17)	-.0671	(.11)	.0000	(.00)	-.2577	(1.76)
FATHER: SERVICE	-.0208	(1.31)	.0120	(.87)	-.1153	(.21)	.0397	(.42)
MOTHER: PROFESSIONAL	.1354	(.09)	.0708	(.06)	.1264	(.07)	-.1021	(.49)
MOTHER: MANAGER	.1341	(.09)	.0801	(.07)	.1121	(.06)	-.1525	(.69)
MOTHER: SALES	.0109	(.01)	.0055	(.00)	.0068	(.00)	-.0289	(.13)
MOTHER: CLERICAL	.1252	(.09)	.0664	(.06)	.1119	(.07)	.0415	(.21)
MOTHER: CRAFTS	.0034	(.00)	.0860	(.08)	.1351	(.08)	-.3760	(1.60)
MOTHER: OPERATIVE	.1255	(.09)	.0800	(.07)	.1119	(.06)	-.0478	(.24)
MOTHER: FARM WORK	.1586	(.11)	.0071	(.00)	-.0001	(.00)	.0429	(.15)
MOTHER: SERVICE	.1342	(.09)	.0795	(.07)	.1088	(.06)	-.0336	(.17)
MOTHER: HH SERVICE	.1298	(.09)	.0767	(.07)	-.0108	(.01)	.0022	(.01)
SOCIOECONOMIC STATUS	-.0004	(1.04)	.0002	(.53)	.0001	(.14)	.0055	(2.32)
NORTH EAST	.0020	(.02)	.0095	(1.54)	-.0000	(.00)	.0576	(1.32)
WEST	-.0043	(.04)	.0114	(1.84)	.0008	(.10)	.0028	(.06)
SOUTH	-.0076	(.08)	.0115	(1.99)	.0029	(.42)	.0025	(.06)
MONTHS EXPERIENCE	.0002	(.00)	.0004	(3.06)	-.0003	(1.75)	.0043	(4.10)
FATH OCC MISSING	-.0280	(.29)	.0045	(.37)	-.0020	(.17)	.0065	(.09)
MOTH OCC MISSING	.1208	(1.25)	.0774	(.07)	.1189	(.07)	-.0737	(.37)
CONSTANT	-.4334	(4.49)	-.1203	(.11)	-.1936	(.11)	.3464	(1.20)
x^2 (SIGNIFICANCE)	200.91	(.00)	53.30	(.02)	39.89	(.26)	93.87	(.00)

TABLE 4-23
(Continued)

Variable / Occupation Equation	Craft (3.5)		Operative (3.6)		Laborer (3.7)		Service (3.10)	
CONCENTRATOR	.0000	(.00)	-.0559	(1.06)	.0040	(.15)	-.1625	(2.87)
LIMITED CONCENTRATOR	.0001	(.08)	-.0483	(1.00)	.0038	(.14)	-.0949	(1.95)
CONCENTRATOR/EXPLORER	.0001	(.10)	.0467	(.97)	.0037	(.13)	-.0704	(1.36)
EXPLORER	.0000	(.00)	.1083	(1.41)	-.0002	(.00)	-.0706	(.70)
INCIDENTAL/PERSONAL	.0001	(.07)	-.0121	(.26)	.0040	(.14)	-.0060	(.13)
INCOMPLETE TRANSCRIPT	.0001	(.08)	.0513	(1.22)	.0036	(.12)	-.0008	(1.96)
HOME ECON SPECIALTY	-.0001	(.04)	-.0848	(.08)	.0008	(1.49)	.1235	(1.78)
YEARS OF EDUCATION	-.0000	(.49)	-.0371	(3.03)	-.0003	(1.68)	-.0238	(1.99)
BLACK	.0000	(.12)	-.0264	(1.05)	.0005	(1.55)	-.0154	(.50)
HISPANIC	-.0001	(.11)	-.0848	(2.65)	-.0005	(1.05)	-.0177	(.51)
FATHER: PROFESSIONAL	-.0001	(.10)	-.0402	(.55)	.0035	(.10)	.0188	(.28)
FATHER: MANAGER	-.0001	(.10)	.0054	(.09)	.0036	(.10)	-.0400	(.63)
FATHER: SALES	-.0000	(.15)	.0454	(.67)	.0001	(.00)	.0497	(.67)
FATHER: CLERICAL	-.0001	(.07)	-.0252	(.34)	.0035	(.10)	.0649	(.90)
FATHER: CRAFTS	-.0000	(.73)	.0639	(1.31)	.0039	(.11)	.0107	(.20)
FATHER: OPERATIVE	-.0000	(.42)	.0528	(1.06)	.0038	(.11)	.0377	(.68)
FATHER: FARMER	-.0000	(.14)	.0183	(.25)	.0044	(.13)	-.0588	(.70)
FATHER: FARM WORK	.0000	(.65)	.1576	(2.18)	-.0004	(.01)	.0081	(.09)
FATHER: SERVICE	-.0000	(.35)	.0729	(1.24)	-.0007	(.01)	.0208	(.30)
MOTHER: PROFESSIONAL	.0000	(.00)	-.0675	(.48)	.0040	(.03)	-.0438	(.31)
MOTHER: MANAGER	-.0000	(.00)	-.0667	(.44)	.0005	(.00)	-.0403	(.27)
MOTHER: SALES	-.0000	(.00)	-.0847	(.58)	.0049	(.04)	-.1281	(.84)
MOTHER: CLERICAL	.0001	(.02)	-.0425	(.32)	.0043	(.04)	-.1708	(1.25)
MOTHER: CRAFTS	.0001	(.03)	.0868	(.61)	.0047	(.04)	-.0851	(.56)
MOTHER: OPERATIVE	.0001	(.02)	.0111	(.08)	.0046	(.04)	-.2220	(1.61)
MOTHER: FARM WORK	.0001	(.01)	.0222	(.12)	.0003	(.00)	-.1599	(.77)
MOTHER: SERVICE	.0001	(.02)	-.0428	(.32)	.0002	(.00)	-.1333	(.98)
MOTHER: HH SERVICE	-.0000	(.00)	.0302	(.22)	-.0002	(.00)	-.1626	(1.10)
SOCIOECONOMIC STATUS	.0000	(.44)	-.0031	(2.15)	.0000	(.32)	-.0021	(1.21)
NORTH EAST	.0000	(.15)	-.0580	(2.01)	.0002	(.68)	-.0404	(1.26)
WEST	-.0000	(.60)	-.0385	(1.30)	.0003	(.76)	-.0191	(.58)
SOUTH	-.0000	(.07)	.0172	(.72)	.0004	(1.40)	-.0541	(1.88)
MONTHS EXPERIENCE	-.0000	(1.05)	.0002	(.31)	-.0000	(.92)	-.0016	(2.02)
FATH OCC MISSING	-.0000	(1.07)	.0741	(1.55)	.0033	(.09)	-.0037	(.07)
MOTH OCC MISSING	.0001	(.02)	-.0323	(.25)	.0043	(.04)	-.1236	(.92)
CONSTANT	-.0002	(.05)	.2238	(1.05)	-.0100	(.08)	.3239	(1.53)
x^2 (SIGNIFICANCE)	45.37	(.11)	110.68	(.00)	47.70	(.08)	51.91	(.04)

NOTE: Dependent variable is defined on a scale from zero to unity. Estimates presented are not the probit coefficients but are a constant multiple of those coefficients and show the partial derivatives of the predicted probability evaluated at the means of the explanatory variables. Except where noted, numbers in parentheses are ratios of estimated coefficients to their estimated standard errors; values greater than approximately 1.65 are statistically significant at the .10 level.

TABLE 4-24

DETERMINANTS OF PROBABILITY OF BEING IN UNIONIZED JOB
(PROBIT ESTIMATES FOR EQUATION (4))
WOMEN

	White			Minority		
	Full Sample	Exactly 12 Years Education	Not Enrolled Since 1977	Full Sample	Exactly 12 Years Education	Not Enrolled Since 1977
CONCENTRATOR	.0318 (.45)	-.0878 (.96)	-.0367 (.56)	.1263 (.93)	.2296 (1.49)	.1317 (.73)
LIMITED CONCENTRATOR	-.0154 (.22)	-.1289 (1.46)	-.0569 (.89)	.1402 (1.21)	.1344 (.95)	-.0036 (.02)
CONCENTRATOR/EXPLORER	-.0003 (.00)	-.0971 (1.02)	-.0210 (.32)	.0435 (.35)	.0916 (.62)	-.1923 (1.11)
EXPLORER	-.0651 (.50)	-.1245 (.81)	.0408 (.40)	-.1064 (.55)	.1721 (.65)	-.0340 (.13)
INCIDENTAL/PERSONAL	.0162 (.26)	-.0661 (.80)	-.0025 (.04)	.0111 (.11)	.0353 (.28)	-.0390 (.28)
INCOMPLETE TRANSCRIPT	.0408 (.79)	-.0455 (.65)	.0206 (.44)	-.0293 (.33)	.0158 (.14)	-.1136 (1.04)
HOME ECON SPECIALTY	-.0073 (.05)	.0600 (.39)	.0605 (.61)	-.0707 (.58)	-.0277 (.21)	.1958 (1.18)
OFFICE SPECIALTY	.0378 (.87)	.0350 (.65)	.0511 (1.25)	-.1415 (1.80)	-.1546 (1.73)	-.1382 (1.21)
PROFESSIONAL	.1328 (1.15)	.1562 (.98)	-.0598 (.02)	-.3542 (2.24)	-.1655 (.89)	.1515 (.63)
MANAGER	-.5382 (.34)	-.5341 (.27)	-.0358 (.01)	-.2365 (1.22)	-.1175 (.54)	.0245 (.10)
SALES	.1146 (.98)	.1543 (1.13)	.4268 (.20)	-1.0551 (.31)	-1.1313 (.32)	-1.0593 (.24)
CLERICAL	.1788 (1.71)	.2105 (1.82)	.4523 (.22)	-.2161 (1.92)	-.1710 (1.31)	-.0129 (.08)
CRAFT	.0279 (.19)	.0166 (.10)	-.0455 (.01)	-.0351 (.17)	.1564 (.65)	.3357 (1.27)
OPERATIVE	.2148 (2.01)	.2205 (1.86)	.4515 (.22)	-.1506 (1.22)	-.0940 (.69)	.0713 (.42)
FARM	.3409 (1.82)	.3721 (1.78)	--	-.1134 (.45)	-.0441 (.16)	1.2752 (.17)
SERVICE	.1027 (.95)	.1114 (.92)	.3884 (.19)	-.1154 (1.00)	-.0084 (.06)	.1515 (.86)
CONSTRUCTION	.1770 (1.72)	.2063 (1.79)	.1166 (1.35)	--	--	--
MANUFACTURING	.1686 (2.31)	.1726 (2.09)	.1456 (2.24)	.1958 (1.85)	.2078 (1.75)	.3613 (2.54)
TRANSPORTATION	.3119 (3.53)	.3118 (2.99)	.2314 (3.02)	.2705 (2.18)	.3814 (2.75)	.3299 (1.82)
TRADE	.0929 (1.32)	.0864 (1.08)	.0694 (1.07)	.0722 (.75)	.1348 (1.26)	.2038 (1.51)
FINANCE	.0360 (.46)	-.0059 (.06)	.0343 (.49)	.1343 (1.26)	.1765 (1.40)	.1241 (.80)
BUSINESS SERVICE	-.0617 (.56)	-.0418 (.33)	.0251 (.29)	.1647 (1.13)	.1160 (.68)	.2823 (1.56)
PROFESSIONAL SERVICE	.1016 (1.43)	.0724 (.89)	.0756 (1.16)	.1289 (1.37)	.0748 (.69)	.1128 (.84)
PUBLIC ADMINISTRATION	.0305 (.33)	.0378 (.33)	.0956 (1.21)	.3377 (2.73)	.3926 (2.68)	.5300 (3.09)
SOCIOECONOMIC STATUS	-.0020 (1.27)	-.0053 (2.41)	-.0009 (.62)	-.0010 (.40)	.0011 (.35)	.0026 (.70)
NORTHEAST	-.0674 (1.94)	-.0780 (1.84)	-.0282 (1.02)	-.0113 (.15)	-.0377 (.41)	-.0596 (.58)
WEST	-.0004 (.01)	-.0239 (.56)	.0054 (.19)	.0056 (.72)	.1079 (1.18)	.1294 (1.29)
SOUTH	.0060 (.21)	-.0388 (1.06)	.0228 (.96)	-.0062 (.93)	-.0623 (.82)	-.1331 (1.49)
MONTHS EXPERIENCE	-.0009 (1.07)	-.0012 (1.11)	-.0007 (1.03)	.0001 (.05)	.0020 (1.08)	-.0006 (.29)
HISPANIC	--	--	--	-.0752 (1.42)	-.1363 (2.07)	-.0378 (.51)
CONSTANT	-.4576 (3.61)	-.3699 (2.56)	-.6442 (.31)	-.0942 (.62)	-.2278 (1.29)	-.2883 (1.35)
X^2 (SIGNIFICANCE)	87.43 (.00)	76.54 (.00)	83.43 (.00)	40.12 (.09)	39.87 (.09)	48.55 (.02)
N	745	544	504	372	273	233

NOTE: Dependent variable is defined on a scale from zero to unity. Estimates presented are not the probit coefficients but are a constant multiple of those coefficients and show the partial derivatives of the predicted probability evaluated at the means of the explanatory variables. Except where noted, numbers in parentheses are ratios of estimated coefficients to their estimated standard errors; values greater than approximately 1.65 are statistically significant at the .10 level.

TABLE 4-25

DETERMINANTS OF PROBABILITY OF BEING IN SPECIFIC INDUSTRIES
(PROBIT ESTIMATES)
WOMEN (N = 1276)

Variable / Industry Equation	Manufacturing (2.4)		Transportation (2.5)		Trade (2.6)		Finance (2.7)	
CONCENTRATOR	-.0457	(1.06)	.0032	(.31)	.0083	(.13)	.0062	(2.02)
LIMITED CONCENTRATOR	-.0675	(1.64)	-.0082	(.75)	.0021	(.04)	.0077	(2.61)
CONCENTRATOR/EXPLORER	-.0892	(1.96)	-.0052	(.44)	.0165	(.27)	.0085	(2.75)
EXPLORER	.0528	(.65)	-.0760	(.09)	-.0376	(.30)	.0092	(1.74)
INCIDENTAL/PERSONAL	-.0133	(.34)	.0076	(.82)	.0383	(.70)	.0074	(2.53)
INCOMPLETE TRANSCRIPT	-.0791	(2.14)	.0045	(.52)	.0529	(1.04)	.0063	(2.25)
HOME ECON SPECIALTY	.0319	(.48)	.0145	(.98)	-.0534	(.53)	-.0338	(.17)
PROFESSION	-.0332	(.61)	.0900	(.25)	-.1021	(1.12)	.0261	(.22)
MANAGEMENT	-.0587	(.91)	.0964	(.27)	.4818	(6.44)	.0290	(.25)
SALES	.5379	(.33)	.0804	(.23)	.1802	(8.59)	.0309	(.27)
CLERICAL	.0295	(.89)	.0884	(.25)	.1542	(3.08)	.0372	(.32)
CRAFT	.3544	(5.87)	.0030	(.00)	-.0759	(.54)	-.0003	(.00)
OPERATIVES	.4089	(11.29)	.0720	(.20)	-.0474	(.77)	.0008	(.01)
FARM WORKER	-.4838	(.10)	.1076	(.30)	-.6900	(.38)	.0001	(.00)
SERVICE	-.1786	(3.28)	.0735	(.31)	.2679	(.38)	.0001	(.00)
BLACKS	-.0036	(.15)	.0046	(.81)	-.1002	(2.94)	-.0008	(.53)
HISPANICS	.0105	(.37)	.0078	(1.25)	.0085	(.23)	.0017	(1.16)
YEARS OF EDUCATION	-.0103	(1.03)	-.0035	(1.41)	-.0107	(.78)	-.0001	(.17)
SOCIOECONOMIC STATUS	-.0023	(1.86)	.0005	(1.62)	.0004	(.27)	.0000	(.57)
NORTHEAST	-.0089	(.36)	.0083	(1.40)	.0616	(1.67)	.0041	(2.84)
WEST	-.0902	(3.12)	-.0031	(.45)	.1036	(2.80)	.0003	(.20)
SOUTH	-.0527	(2.26)	-.0013	(.22)	.1204	(3.65)	-.0005	(.34)
MONTHS OF EXPERIENCE	.0014	(2.18)	-.0000	(.19)	-.0005	(.57)	-.0000	(.99)
CONSTANT	-.0504	(.37)	-.0961	(.27)	-.3129	(1.68)	-.0489	(.42)
X^2 (SIGNIFICANCE)	596.66	(.00)	38.09	(.05)	247.27	(.00)	238.43	(.00)

TABLE 4-25
(CONTINUED)

Variable / Industry Equation	Business Services (2.8)		Personal Services (2.9)		Professional Services (2.11)		Public Administration (2.12)	
CONCENTRATOR	-.0004	(.03)	-.0052	(.38)	.0130	(.29)	-.0002	(.04)
LIMITED CONCENTRATOR	.0090	(.93)	.0015	(.13)	-.0327	(.79)	-.0023	(.46)
CONCENTRATOR/EXPLORER	.0184	(1.93)	-.0034	(.27)	-.0406	(.89)	-.0056	(.93)
EXPLORER	-.0701	(.09)	-.1038	(.12)	-.0400	(.40)	-.0513	(.08)
INCIDENTAL/PERSONAL	.0037	(.39)	.0083	(.76)	-.0687	(1.72)	-.0046	(.90)
INCOMPLETE TRANSCRIPT	.0083	(.94)	.0062	(.59)	-.0698	(1.89)	-.0000	(.01)
HOME ECON SPECIALTY	-.0769	(.13)	-.0130	(.75)	.1160	(1.70)	.0037	(.45)
PROFESSION	.0786	(.25)	-.1073	(.27)	.5472	(7.70)	-.0026	(.31)
MANAGEMENT	.0860	(.27)	-.1166	(.20)	.0354	(.32)	-.0028	(.34)
SALES	.0003	(.00)	-.0275	(1.84)	.0042	(.04)	-.0432	(.10)
CLERICAL	.0865	(.27)	-.0321	(4.67)	.2767	(4.47)	.0121	(2.41)
CRAFT	.0840	(.27)	-.0134	(.83)	-.3860	(.31)	-.0440	(.06)
OPERATIVES	.0785	(.25)	-.0277	(3.34)	-.0878	(.92)	-.0467	(.21)
FARM WORKER	.0017	(.00)	-.1164	(.08)	.2373	(1.69)	-.0448	(.04)
SERVICE	.0800	(.25)	-.0008	(.13)	.4312	(6.84)	-.0029	(.46)
BLACKS	-.0011	(.20)	-.0008	(.13)	.0599	(2.40)	.0039	(1.40)
HISPANICS	.0008	(.12)	.0110	(1.73)	-.0754	(2.35)	-.0042	(1.11)
YEARS OF EDUCATION	.0025	(.01)	-.0102	(2.34)	.0289	(2.94)	-.0000	(.04)
SOCIOECONOMIC STATUS	.0004	(.01)	.0001	(.27)	-.0015	(1.18)	-.0001	(.72)
NORTHEAST	-.0060	(1.00)	-.0139	(1.82)	-.0709	(2.53)	-.0013	(.35)
WEST	.0058	(1.10)	-.0059	(.90)	-.0437	(1.49)	.0018	(.48)
SOUTH	-.0034	(.67)	.0013	(.24)	-.0498	(1.97)	.0051	(1.67)
MONTHS OF EXPERIENCE	-.0000	(.25)	.0000	(.25)	-.0000	(.07)	.0001	(1.58)
CONSTANT	-.1669	(.52)	.0855	(1.58)	-.7320	(5.15)	-.0370	(2.16)
X^2 (SIGNIFICANCE)	36.20	(.05)	82.16	(.00)	367.39	(.00)	72.51	(.00)

NOTE: Dependent variable is defined on a scale from zero to unity. Estimates presented are not the probit coefficients but are a constant multiple of those coefficients and show the partial derivatives of the predicted probability evaluated at the means of the explanatory variables. Except where noted, numbers in parentheses are ratios of estimated coefficients to their estimated standard errors; values greater than approximately 1.65 are statistically significant at the .10 level.

TABLE 4-26

DETERMINANTS OF (LOG) EARNINGS PER HOUR

(OLS ESTIMATES FOR EQUATION (1))

WHITE WOMEN

VARIABLE	FULL SAMPLE		12 YEARS EDUCATION		NOT ENROLLED SINCE 1977	
INTERCEPT	0.3127	(1.90)	.7462	(0.00)	0.0472	(0.18)
CONCENTRATOR	0.1072	(1.56)	0.1345	(1.48)	0.2050	(2.23)
LIMIT CONCENTRATOR	0.0953	(1.49)	0.1233	(1.44)	0.2056	(2.39)
CONCENTRATOR/EXPLOR	0.0482	(0.71)	0.0542	(0.59)	0.1046	(1.16)
EXPLORER	-0.0270	(-0.21)	-0.0898	(-0.55)	0.0593	(0.34)
INCIDENTAL/PERSONAL	0.0663	(1.15)	0.0587	(0.70)	0.1142	(1.46)
INCOMP. TRANSCRIPT	0.0271	(0.56)	0.0200	(0.27)	0.0472	(0.71)
HOME EC SPECIALTY	-0.0100	(-0.07)	-0.0138	(-0.08)	-0.1129	(-0.78)
OFFICE SPECIALTY	-0.0553	(-1.36)	-0.0546	(-1.12)	-0.0988	(-1.80)
YEARS OF EDUCATION	0.0378	(3.21)	-----		0.0544	(2.68)
SOCIOECONOMIC SCALE	0.0057	(3.39)	0.0050	(2.24)	0.0043	(1.86)
MONTHS TENURE	0.0034	(1.58)	0.0017	(0.64)	0.0039	(1.54)
SQ OF MONTHS TENURE	-0.0000	(-1.26)	-.0000	(-0.56)	-.0000	(-1.22)
MONTHS EXPERIENCE	0.0129	(3.88)	0.0127	(3.15)	0.0128	(2.98)
SQ OF MTHS EXPER	-0.0001	(-2.63)	-0.0001	(-1.99)	-0.0001	(-2.15)
NORTHEAST	0.0327	(1.00)	0.0203	(0.50)	0.0410	(1.04)
SOUTH	-0.0528	(-1.75)	-0.0487	(-1.31)	-0.0466	(-1.22)
WEST	0.0752	(2.13)	0.0882	(2.09)	0.0901	(2.11)
CONSTRUCTION	0.4647	(4.70)	0.5051	(4.54)	0.4049	(3.39)
MANUFACTURING	0.3047	(5.51)	0.3437	(5.67)	0.3558	(5.49)
TRANSPORTATION	0.3567	(4.35)	0.3798	(3.90)	0.3830	(4.01)
TRADE	0.2168	(4.18)	0.2601	(4.43)	0.2657	(4.24)
FINANCE	0.2389	(4.04)	0.2776	(4.12)	0.2677	(3.71)
BUSINESS SERVICE	0.2414	(3.15)	0.2510	(2.70)	0.2376	(2.59)
ENTERTAINMENT/REC	0.2941	(1.57)	0.6780	(2.05)	0.6789	(2.08)
PROF. SERVICE	0.2716	(5.01)	0.2719	(4.40)	0.3005	(4.66)
PUBLIC ADMIN.	0.3530	(4.64)	0.3712	(3.83)	0.4136	(4.10)
UNIONIZED JOB	0.1151	(3.61)	0.1141	(3.00)	0.0858	(2.13)
R-SQUARED	.21		.19		.21	
F-STATISTIC	6.91		4.45		4.67	
N	738		539		500	

NOTE: THE NUMBERS IN PARENTHESES ARE T-STATISTICS; VALUES GREATER THAN APPROXIMATELY 1.65 ARE STATISTICALLY SIGNIFICANT AT THE .10 LEVEL.

TABLE 4-27

SUMMARY OF DIRECT, INDIRECT, AND TOTAL EFFECTS ON HOURLY EARNINGS
WHITE WOMEN
(PERCENT)

	Concentrators	Limited Concentrators	Concentrator/ Explorers	Occupational Home Economics Specialists	Office Specialists
Direct	10.7	9.5	4.8	-1.0	-5.5
Indirect, through:	6.0	1.3	-1.1	-2.7	1.6
Education	-3.6	-3.2	-2.6	.3	.6
Tenure	2.0	.8	.4	1.0	.5
Experience	5.6	5.4	3.2	-	-
Manufacturing	-	-1.4	-1.0	-.8	-
Transportation	.6	-	.1	-.6	-
Trade	.6	.2	.4	-1.5	-
Finance	.4	.3	.3	-.6	-
Business Services	.1	.3	.6	-.3	-
Professional Services	-.6	-1.3	-2.7	2.3	-
Public Administration	.2	.1	-.3	.1	-
Unionization	.7	-.1	.1	-.4	.4
TOTAL	16.7	10.8	3.8	-3.7	-3.9

NOTE: Components may not add to totals because of rounding. A - indicates an effect less than .1.

TABLE 4-28

DETERMINANTS OF YEARS OF EDUCATION

(OLS ESTIMATES FOR EQUATION (7))

MINORITY WOMEN

VARIABLE	FULL SAMPLE		NOT ENROLLED SINCE 1977	
INTERCEPT	11.30	(12.96)	12.28	(15.40)
CONCENTRATOR	-0.29	(-1.09)	-0.49	(-2.05)
LIMIT CONCENTRATOR	0.05	(0.25)	-0.31	(-1.49)
CONCENTRATOR/EXPLOR	-0.09	(-0.39)	-0.43	(-1.96)
EXPLORER	0.09	(0.27)	0.12	(0.40)
INCIDENTAL/PERSONAL	-0.12	(-0.60)	-0.32	(-1.67)
INCOMP. TRANSCRIPT	0.41	(1.24)	0.12	(0.40)
HOME EC SPECIALTY	0.02	(0.10)	0.05	(0.21)
OFFICE SPECIALTY	0.15	(0.99)	0.18	(1.20)
SOCIOECONOMIC SCALE	0.06	(2.80)	0.04	(2.10)
RURAL RESIDENCE	0.16	(1.25)	0.07	(0.65)
NORTHEAST	0.14	(0.97)	-0.00	(-0.06)
SOUTH	0.06	(0.49)	-0.03	(-0.29)
WEST	0.17	(1.31)	0.06	(0.49)
YEARS ED ASPIRED TO	0.14	(6.72)	0.09	(4.50)
ASPIR. DATA MISSING	1.80	(1.95)	1.12	(1.60)
FATHER'S EDUCATION	-0.10	(-2.55)	-0.08	(-2.32)
MOTHER'S EDUCATION	-0.03	(-1.13)	-0.03	(-1.28)
HIGH SCHOOL GPA	0.24	(2.58)	0.10	(1.07)
GPA MISSING	0.14	(0.73)	-0.03	(-0.20)
R-SQUARED	.20		.15	
F-STATISTIC	5.46		2.29	
N	438		268	

NOTE: THE NUMBERS IN PARENTHESES ARE T-STATISTICS; VALUES GREATER THAN APPROXIMATELY 1.65 ARE STATISTICALLY SIGNIFICANT AT THE .10 LEVEL.

TABLE 4-29

DETERMINANTS OF MONTHS OF LABOR MARKET EXPERIENCE

(OLS ESTIMATES FOR EQUATION (6))

MINORITY WOMEN

VARIABLE	FULL SAMPLE		12 YEARS EDUCATION		NOT ENROLLED SINCE 1977	
INTERCEPT	-78.90	(-7.78)	-88.19	(0.00)	-104.65	(-5.33)
CONCENTRATOR	0.46	(0.14)	0.06	(0.01)	1.24	(0.28)
LIMIT CONCENTRATOR	-0.70	(-0.26)	0.04	(0.01)	2.73	(0.71)
CONCENTRATOR/EXPLOR	0.06	(0.02)	-0.40	(-0.12)	2.84	(0.72)
EXPLORER	-6.05	(-1.26)	-5.85	(-1.00)	-4.20	(-0.64)
INCIDENTAL/PERSONAL	0.81	(0.30)	1.30	(0.42)	2.81	(0.72)
INCOMP. TRANSCRIPT	-2.06	(-0.86)	-2.49	(-0.91)	-0.23	(-0.07)
HISPANIC	3.23	(2.70)	2.89	(2.11)	5.08	(3.07)
SOCIOECONOMIC SCALE	0.01	(0.15)	-0.05	(-0.74)	-0.10	(-0.99)
RURAL RESIDENCE	0.82	(0.47)	0.89	(0.45)	1.83	(0.78)
AGE	5.17	(12.71)	5.32	(12.34)	5.95	(8.80)
YEARS OF EDUCATION	-0.53	(-0.79)	------		0.01	(0.01)
R-SQUARED	.30		.34		.28	
F-STATISTIC	16.60		14.64		9.14	
N	437		325		268	

NOTE: THE NUMBERS IN PARENTHESES ARE T-STATISTICS; VALUES GREATER THAN APPROXIMATELY 1.65 ARE STATISTICALLY SIGNIFICANT AT THE .10 LEVEL.

TABLE 4-30

DETERMINANTS OF MONTHS OF TENURE WITH CURRENT EMPLOYER

(OLS ESTIMATES FOR EQUATION (5))

MINORITY WOMEN

VARIABLE	FULL SAMPLE		12 YEARS EDUCATION		NOT ENROLLED SINCE 1977	
INTERCEPT	4.7296	(1.95)	3.4767	(1.25)	6.0409	(1.69)
CONCENTRATOR	-7.6114	(-2.23)	-7.1186	(-1.90)	-8.5818	(-1.73)
LIMIT CONCENTRATOR	-8.3678	(-2.85)	-7.5238	(-2.28)	-9.0447	(-2.09)
CONCENTRATOR/EXPLOR	-6.9410	(-2.26)	-4.9419	(-1.44)	-7.9072	(-1.77)
EXPLORER	-5.9398	(-1.38)	-4.2151	(-0.80)	-11.3124	(-1.83)
INCIDENTAL/PERSONAL	-3.4465	(-1.33)	-1.4561	(-0.49)	-1.3713	(-0.34)
INCOMP. TRANSCRIPT	-4.7472	(-2.23)	-3.4719	(-1.41)	-5.7242	(-1.87)
HOME EC SPECIALTY	5.8944	(1.87)	4.7233	(1.40)	5.4403	(1.12)
OFFICE SPECIALTY	3.9491	(1.99)	4.7035	(2.14)	5.4766	(1.80)
HISPANIC	-1.3354	(-1.22)	-1.1943	(-0.95)	-1.3677	(-0.85)
SOCIOECONOMIC SCALE	-0.1787	(-2.88)	-0.1249	(-1.76)	-0.1366	(-1.40)
MONTHS EXPERIENCE	0.4570	(3.79)	0.4229	(3.07)	0.4877	(2.70)
SQ OF MTHS EXPER	0.0005	(0.24)	0.0034	(1.42)	0.0000	(0.01)
FARM WORK	-1.3666	(-0.21)	-1.0138	(-0.16)	-3.9465	(-0.31)
R-SQUARED	.32		.43		.32	
F-STATISTIC	15.43		18.23		9.23	
N-STATISTIC	436		324		267	

NOTE: THE NUMBERS IN PARENTHESES ARE T-STATISTICS; VALUES GREATER THAN APPROXIMATELY 1.65 ARE STATISTICALLY SIGNIFICANT AT THE .10 LEVEL.

TABLE 4-31

DETERMINANTS OF (LOG) EARNINGS PER HOUR

(OLS ESTIMATES FOR EQUATION (1))

MINORITY WOMEN

VARIABLE	FULL SAMPLE		12 YEARS EDUCATION		NOT ENROLLED SINCE 1977	
INTERCEPT	-0.0303	(-0.10)	.04583	(0.00)	-0.3814	(-0.81)
CONCENTRATOR	0.0113	(0.09)	-0.0572	(-0.40)	0.1000	(0.66)
LIMIT CONCENTRATOR	-0.0269	(-0.25)	-0.0844	(-0.66)	0.0422	(0.32)
CONCENTRATOR/EXPLOR	0.0549	(0.49)	0.0018	(0.01)	0.1587	(1.18)
EXPLORER	0.3688	(2.52)	0.3489	(1.88)	0.3189	(1.83)
INCIDENTAL/PERSONAL	0.0099	(0.10)	-0.0134	(-0.12)	0.1058	(0.92)
INCOMP. TRANSCRIPT	0.0992	(1.28)	0.0338	(0.36)	0.1042	(1.15)
HOME EC SPECIALTY	0.0877	(0.76)	0.0958	(0.74)	-0.0386	(-0.27)
OFFICE SPECIALTY	0.1118	(1.54)	0.0814	(0.97)	0.1092	(1.20)
HISPANIC	0.0302	(0.66)	0.0598	(1.04)	0.0443	(0.77)
YEARS OF EDUCATION	0.0381	(1.79)	-----		0.0722	(1.97)
SOCIOECONOMIC SCALE	0.0018	(0.79)	0.0037	(1.39)	0.0041	(1.40)
MONTHS TENURE	-0.0030	(-0.71)	-0.0032	(-0.67)	-0.0027	(-0.58)
SQ OF MONTHS TENURE	.0001	(0.80)	.0001	(0.62)	.0000	(0.60)
MONTHS EXPERIENCE	0.0179	(3.36)	0.0210	(3.26)	0.0143	(2.18)
SQ OF MTHS EXPER	-0.0002	(-2.46)	-0.0002	(-2.40)	-0.0001	(-1.67)
NORTHEAST	-0.0672	(-0.99)	-0.0720	(-0.89)	0.0638	(0.80)
SOUTH	-0.0775	(-1.32)	-0.1071	(-1.59)	0.0368	(0.54)
WEST	-0.0225	(-0.33)	-0.0950	(-1.19)	0.0190	(0.23)
MANUFACTURING	0.7259	(8.75)	0.7507	(8.26)	0.5678	(5.80)
TRANSPORTATION	0.7996	(7.03)	0.8313	(6.34)	0.5764	(4.06)
TRADE	0.4895	(5.97)	0.5317	(5.80)	0.3303	(3.31)
FINANCE	0.6388	(7.12)	0.7044	(6.73)	0.5115	(4.83)
BUSINESS SERVICE	0.5152	(3.96)	0.5482	(3.78)	0.3443	(2.44)
ENTERTAINMENT/REC	0.8944	(5.05)	0.9188	(4.62)	0.4477	(2.06)
PROF. SERVICE	0.5352	(6.43)	0.5826	(6.10)	0.4590	(4.60)
PUBLIC ADMIN.	0.6962	(5.99)	0.7339	(5.33)	0.5200	(3.82)
UNIONIZED JOB	0.0458	(1.01)	0.0346	(0.64)	0.1566	(2.90)
R-SQUARED	.33		.36		.32	
F-STATISTIC	6.30		5.04		3.50	
N	369		270		231	

NOTE: THE NUMBERS IN PARENTHESES ARE T-STATISTICS; VALUES GREATER THAN APPROXIMATELY 1.65 ARE STATISTICALLY SIGNIFICANT AT THE .10 LEVEL.

TABLE 4-32

SUMMARY OF DIRECT, INDIRECT, AND TOTAL EFFECTS ON HOURLY EARNINGS
MINORITY WOMEN
(PERCENT)

	Concentrators	Limited Concentrators	Concentrator/ Explorers	Occupational Home Economics Specialists	Office Specialists
Direct	1.1	-2.7	5.5	8.8	11.2
Indirect, through:	1.7	-5.4	-5.9	-5.7	-.2
Education	-1.1	.2	-.3	.1	.6
Tenure	1.0	1.3	.9	-	-.1
Experience	.9	-1.3	.1	-	-
Manufacturing	-1.3	-4.9	-3.7	-1.2	-
Transportation	.6	-.7	-.3	.7	-
Trade	.5	-.3	.1	-.3	-
Finance	.9	.8	.6	-2.3	-
Business Services	-	.4	1.0	-4.2	-
Professional Services	-.5	-1.8	-3.9	3.5	-
Public Administration	.4	.1	-.5	.5	-
Unionization	.5	.5	-	-	-.6
TOTAL	2.8	-8.1	-.5	3.1	11.0

NOTE: Components may not add to totals because of rounding. A - indicates an effect less than .1.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

Conclusions concerning the effects of secondary vocational education on labor market outcomes are not straightforward or easily drawn. Indeed, the most striking finding in this report is probably the great variation that is apparent within the area identified as secondary vocational education. But in terms of the problems that were posed at the beginning of this study, general answers can be suggested:

1. Differences in median earnings suggest even greater similarity between vocational and non-vocational students than one would infer from mean earnings data. The failure to find positive direct or total effects for men on hourly earnings is not the result of vocational education being irrelevant to labor market outcomes. It occurs primarily because of negative direct effects on earnings and because of four indirect conflicting tendencies that offset each other. Concentration in vocational education increases job tenure and allows students to accumulate more work experience. It is associated with obtaining work in industries that contain higher paying jobs. But it is also associated with fewer years of educational attainment. And those people who concentrate in vocational education are less likely to work in unionized jobs.

2. Differences in the apparent effects of vocational education for men and women are attributable to basic differences in the separate labor markets in which members of each sex usually find work. Concentration in secondary vocational education reduces educational attainment more for women than it does for men, and an additional year's education has as large an effect on earnings for women as it does for men. But vocational education apparently is more successful for women than for men in directing its students into industries and occupations that are well paid (compared to other jobs traditionally held by women). Also, being in a unionized job creates a smaller differential for women than it does for men, and there is no tendency for women vocational graduates to be less likely to be in unionized jobs.

3. Relative advantages in annual earnings for vocational graduates are attributable to longer average hours worked and to a higher average number of weeks worked per year. They do not seem to be attributable to any tendency for vocational graduates to work more frequently at multiple jobs, though they may work at a greater number of different jobs over a year. The longer average job tenure for vocational graduates and their more frequent tendency to be full-time labor force participants suggest a firmer attachment (during the early years of the life cycle) to the labor market and a more stable pattern of labor market involvement.

The findings regarding indirect effects have several implications for vocational education policy. First, indirect effects on earnings of vocational education, although not negligible, are also not dramatic. No single indirect effect in figure 4-1 accounts for more than about a 5 percent difference in earnings. But in circumstances in which total differentials are at most 10 to 15 percent, even a source of a 1 percent differential is not trivial. Changes in the frequency with which students participate in secondary vocational education are not going to produce drastic shifts in income or national productive capacity. But changes in secondary vocational education may be able to contribute modestly to improving productivity and toward narrowing income differentials.

Second, any suggestions by administrators or legislators for program improvements and modifications must allow for the great variation among vocational participants that is evident in this study. Administrators and instructors must remain flexible in designing new programs or suggesting changes in existing programs.

Third, some changes in secondary vocational education may be called for in light of the finding here that vocational education differs substantially between whites and minority graduates in its capacity to foster longer job tenure, more labor market experience, and greater labor market stability. The difference is more striking for men than for women, and it has a longer impact on earnings for men than for women. The exact direction such changes might follow requires more research and discussion.

Fourth, several separate findings in this study suggest that policymakers and adminstrators should not place a heavy emphasis on hourly earnings alone as an evaluative criterion for vocational education. The interpretation of hourly earnings as the best indicator of the value of a person's productivity is valid only under fairly stringent assumptions regarding the competitiveness of labor markets, the availability of labor market

information, the absence of seasonal or cyclical variations in employment or productivity, and the absence of differences among jobs in working conditions. Administrators and policymakers in vocational education must recognize that compensating differentials in earnings may be important, for there are ample indications from this study that the presence of compensating differentials may cause hourly earnings to understate the benefits that accrue to vocational graduates.

For example, the longer average job tenure of vocational graduates (even after allowing for differences in labor market experience), their tendency to work more hours per week (and for some to work very long hours per week), their tendency to work more weeks per year, and the absence of any tendency for them to experience more frequent voluntary job separations suggest that they may be more satisfied with their jobs than are other graduates. It may also reflect a preference for jobs that have more stable employment prospects. Also, the propensity for male vocational education graduates to work in unionized jobs less frequently (particularly for crafts jobs in manufacturing) than other graduates and to work more often in smaller, single establishment businesses suggests differences in individual preferences rather than in opportunity. They may prefer to work in environments that are less formally structured, that allow for greater flexibility in hours and working conditions, or that allow more opportunity to do the whole job instead of only a fragment of it. Results from the NLS Youth that are not shown here suggest that vocational graduates do report slightly more often than nonvocational graduates that their jobs do provide the advantages just listed. A decision by vocational graduates to work at such jobs may signal a willingness to accept lower hourly earnings in return for the preferred working environment and for the greater employment stability. To the extent that this tradeoff occurs, hourly earnings figures understate the total benefits received by vocational graduates.

Fifth, the results of this study suggest that vocational education can make a modest contribution to reducing sex stereotypes in employment and to reducing income inequality between the sexes. Women vocational graduates who specialize in the trade and industry area seem to be successful in finding employment in crafts or operative jobs, usually in manufacturing. Although these jobs pay less than many other traditionally male jobs, they frequently pay more than many jobs that are traditionally held by women. To the extent that the society decides that reducing sex stereotypes in employment is desirable, vocational education can contribute. The extent to which it will contribute depends on the flexibility and responsiveness of state and local administrators and instructors and the strength of incentives that national policymakers decide to offer.

The findings in this study also suggest directions for future research. First, the estimates offered here of indirect effects of vocational education are based on only one of many possible specifications of the sequence of the effects. It would be interesting to know how sensitive those estimates are to the specification of sequences. The specification here was recursive. Future efforts should allow for a greater degree of simultaneity among the dependent variables in equations (1) thru (7).

Second, more controls should be added to the model to improve the correction for any bias attributable to nonrandom selection into the various patterns of participation in vocational education. This suggestion involves modeling the choice of high school curriculum and allowing for correlation of residuals across equations. Measures of attitudes and aspirations both before and after participation in vocational education are available for only a small fraction of the NLS Youth sample.

Third, constraints on time and resources prevented the natural extension of the approach used in this report to regression analyses of annual income, weeks worked per year, hours worked per week, and fraction of labor force time spent unemployed. Preliminary analyses were conducted, and although the results of the analyses are hinted at several times in the discussion, a full treatment could not be incorporated into this report before the deadline for submission to the sponsor. Additional research to permit presentation and discussion of these additional results is called for.

Fourth, research is needed into methods for assessing and reflecting adequately in analysis the quality and availability of a school's vocational education programs.

Fifth, the specification in this report of postsecondary experiences can be improved upon. Years of educational attainment was the measure used here because the construction of a model that estimates the effects of participation in vocational education on types of postsecondary education is a major task in itself. An effort was made last year at the National Center to estimate such effects (see Campbell, Gardner, and Seitz 1982). But the young age of the NLS Youth data required an estimate of the probabilities of having "a successful postsecondary experience" (which may involve still being in the program at the interview date) rather than the probability of completing specified programs.

Finally, the consideration that prompted the suggestion that nonpecuniary aspects of jobs could be important for assessing the effect of vocational education does suggest the need for a close examination of the job satisfaction of vocational graduates. Recent studies have suggested that the importance of job satisfaction in career decisions and in the maintenance of high

productivity has been increasing (Wanous 1980). That examination is currently underway in another project at the National Center.*

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*Campbell, Mertens, and Seitz (forthcoming).

APPENDIX

TABLE A-1
DESCRIPTIVE STATISTICS
FOR REGRESSION/PROBIT DATA
WHITE MALES, FULL SAMPLE (N=835)

VARIABLE	MEAN	STANDARD DEVIATION	MINIMUM VALUE	MAXIMUM VALUE
CONCENTRATOR	0.08503	0.27909	0.00000	1.00000
LIM. CONCENTRATOR	0.10659	0.30877	0.00000	1.00000
CONCENTRATOR/EXPL	0.05269	0.22356	0.00000	1.00000
EXPLORER	0.01796	0.13290	0.00000	1.00000
INCIDENTAL/PERSON	0.21796	0.41311	0.00000	1.00000
INC. TRANSCRIPT	0.38443	0.48675	0.00000	1.00000
AGRIC. SPECIALTY	0.05389	0.22594	0.00000	1.00000
T & I SPECIALTY	0.16287	0.36947	0.00000	1.00000
HOME EC SPECIALTY	0.00120	0.03461	0.00000	1.00000
OFFICE SPECIALTY	0.13653	0.34355	0.00000	1.00000
HISPANIC	0.00000	0.00000	0.00000	0.00000
BLACK	0.00000	0.00000	0.00000	0.00000
YEARS EDUCATION	12.38084	0.96142	12.00000	17.00000
SES	-0.19281	7.17860	-32.00000	32.00000
MONTHS TENURE	14.85887	19.27316	0.00000	182.00000
EXPERIENCE	26.13973	14.79744	0.46154	62.76923
NORTHEAST	0.19281	0.39474	0.00000	1.00000
SOUTH	0.26108	0.43949	0.00000	1.00000
WEST	0.17246	0.37800	0.00000	1.00000
AGRICULTURE	0.03713	0.18918	0.00000	1.00000
MINING	0.01916	0.13718	0.00000	1.00000
CONSTRUCTION	0.12216	0.32766	0.00000	1.00000
MANUFACTURING	0.28862	0.45339	0.00000	1.00000
TRANSPORTATION	0.05030	0.21869	0.00000	1.00000
TRADE	0.25988	0.43883	0.00000	1.00000
FINANCE	0.02036	0.14131	0.00000	1.00000
BSNS SERVICES	0.07784	0.26809	0.00000	1.00000
PERS SERVICES	0.01317	0.11409	0.00000	1.00000
ENTERTAINMENT	0.00958	0.09747	0.00000	1.00000
PROF. SERVICES	0.03713	0.18918	0.00000	1.00000
PUB. ADMIN.	0.01916	0.13718	0.00000	1.00000
PROFESSIONAL	0.05629	0.23061	0.00000	1.00000
MANAGERIAL	0.06108	0.23962	0.00000	1.00000
SALES	0.03353	0.18013	0.00000	1.00000
CLERICAL	0.08383	0.27730	0.00000	1.00000
CRAFT	0.24671	0.43135	0.00000	1.00000
OPERATIVE	0.25988	0.43883	0.00000	1.00000
LABORER	0.11976	0.32488	0.00000	1.00000
FARMER	0.00479	0.06909	0.00000	1.00000
FARM LABOR	0.02275	0.14921	0.00000	1.00000
SERVICE	0.06946	0.25439	0.00000	1.00000
HH SERVICE	0.00000	0.00000	0.00000	0.00000
UNION	0.26357	0.44085	0.00000	1.00000
ED ASPIRATIONS	14.07305	2.38514	0.00000	18.00000
MISSING ED ASP	0.00599	0.07720	0.00000	1.00000

TABLE A-1
DESCRIPTIVE STATISTICS
FOR REGRESSION/PROBIT DATA
WHITE MALES, FULL SAMPLE (N=835)
(CONT.)

FATHER EDUC.	11.61783	3.01037	0.00000	20.00000
MOTHER EDUC.	11.66889	2.25670	0.00000	18.00000
H.S. GPA	1.38814	1.20047	0.00000	3.81000
MISSING GPA	0.33293	0.47155	0.00000	1.00000
RURAL	0.27186	0.44518	0.00000	1.00000
AGE	20.51138	1.44219	16.00000	23.00000
FATH PROF.	0.10180	0.30256	0.00000	1.00000
FATH MANAGER	0.11856	0.32347	0.00000	1.00000
FATH SALES	0.04431	0.20591	0.00000	1.00000
FATH CLERICAL	0.03713	0.18918	0.00000	1.00000
FATH CRAFT	0.22036	0.41474	0.00000	1.00000
FATH OPERATIVE	0.15449	0.36164	0.00000	1.00000
FATH LABORER	0.02994	0.17052	0.00000	1.00000
FATH FARMER	0.03353	0.18013	0.00000	1.00000
FATH FARM LABOR	0.00838	0.09123	0.00000	1.00000
FATH SERVICE	0.04431	0.20591	0.00000	1.00000
FATH HH SERVICE	0.00000	0.00000	0.00000	0.00000
MOTH PROF.	0.06108	0.23962	0.00000	1.00000
MOTH MANAGER	0.01557	0.12387	0.00000	1.00000
MOTH SALES	0.03593	0.18622	0.00000	1.00000
MOTH CLERICAL	0.15090	0.35816	0.00000	1.00000
MOTH CRAFT	0.00359	0.05987	0.00000	1.00000
MOTH OPERATIVE	0.07066	0.25641	0.00000	1.00000
MOTH LABORER	0.00838	0.09123	0.00000	1.00000
MOTH FARMER	0.00000	0.00000	0.00000	0.00000
MOTH FARM LABOR	0.00240	0.04891	0.00000	1.00000
MOTH SERVICE	0.09940	0.29938	0.00000	1.00000
MOTH HH SERVICE	0.00719	0.08451	0.00000	1.00000
HOURLY EARNINGS	5.27257	2.21782	0.27043	19.64286
HOURS PER WEEK	43.76527	8.52236	30.00000	96.00000
1980 INCOME	7874.58068	5267.61467	0.00000	29000.00000

TABLE A-2
DESCRIPTIVE STATISTICS
FOR REGRESSION/PROBIT DATA
MINORITY MALES, FULL SAMPLE (N=435)

VARIABLE	MEAN	STANDARD DEVIATION	MINIMUM VALUE	MAXIMUM VALUE
CONCENTRATOR	0.07816	0.26873	0.00000	1.00000
LIM. CONCENTRATOR	0.09885	0.29880	0.00000	1.00000
CONCENTRATOR/EXPL	0.06667	0.24973	0.00000	1.00000
EXPLORER	0.01149	0.10672	0.00000	1.00000
INCIDENTAL/PERSON	0.16552	0.37207	0.00000	1.00000
INC. TRANSCRIPT	0.45057	0.49812	0.00000	1.00000
AGRIC. SPECIALTY	0.05057	0.21938	0.00000	1.00000
T & I SPECIALTY	0.17701	0.38212	0.00000	1.00000
HOME EC SPECIALTY	0.00460	0.06773	0.00000	1.00000
OFFICE SPECIALTY	0.10345	0.30489	0.00000	1.00000
HISPANIC	0.38161	0.48634	0.00000	1.00000
BLACK	0.61839	0.48634	0.00000	1.00000
YEARS EDUCATION	12.36092	0.89331	12.00000	19.00000
SES	-5.70805	8.85806	-35.00000	22.00000
MONTHS TENURE	12.68506	15.27021	0.00000	93.00000
EXPERIENCE	22.53899	14.61699	0.00000	64.15384
NORTHEAST	0.14713	0.35464	0.00000	1.00000
SOUTH	0.43678	0.49656	0.00000	1.00000
WEST	0.26667	0.44273	0.00000	1.00000
AGRICULTURE	0.03218	0.17669	0.00000	1.00000
MINING	0.00460	0.06773	0.00000	1.00000
CONSTRUCTION	0.07356	0.26136	0.00000	1.00000
MANUFACTURING	0.30345	0.46028	0.00000	1.00000
TRANSPORTATION	0.07126	0.25756	0.00000	1.00000
TRADE	0.22299	0.41673	0.00000	1.00000
FINANCE	0.02759	0.16397	0.00000	1.00000
BSNS SERVICES	0.05517	0.22858	0.00000	1.00000
PERS SERVICES	0.02529	0.15718	0.00000	1.00000
ENTERTAINMENT	0.01379	0.11677	0.00000	1.00000
PROF. SERVICES	0.08276	0.27583	0.00000	1.00000
PUB. ADMIN.	0.04368	0.20461	0.00000	1.00000
PROFESSIONAL	0.04598	0.20968	0.00000	1.00000
MANAGERIAL	0.03218	0.17669	0.00000	1.00000
SALES	0.02299	0.15004	0.00000	1.00000
CLERICAL	0.11034	0.31368	0.00000	1.00000
CRAFT	0.12644	0.33272	0.00000	1.00000
OPERATIVE	0.29425	0.45623	0.00000	1.00000
LABORER	0.14253	0.34999	0.00000	1.00000
FARMER	0.00000	0.00000	0.00000	0.00000
FARM LABOR	0.02299	0.15004	0.00000	1.00000
SERVICE	0.15862	0.36574	0.00000	1.00000
HH SERVICE	0.00000	0.00000	0.00000	0.00000
UNION	0.35567	0.47933	0.00000	1.00000
ED ASPIRATIONS	14.44368	2.39304	0.00000	18.00000
MISSING ED ASP	0.00690	0.08285	0.00000	1.00000

TABLE A-2
DESCRIPTIVE STATISTICS
FOR REGRESSION/PROBIT DATA
MINORITY MALES, FULL SAMPLE (N=435)
(CONT.)

FATHER EDUC.	9.97641	3.65433	0.00000	20.00000
MOTHER EDUC.	9.99508	3.46390	0.00000	16.00000
H.S. GPA	1.14411	1.13017	0.00000	3.76000
MISSING GPA	0.41839	0.49386	0.00000	1.00000
RURAL	0.13103	0.33783	0.00000	1.00000
AGE	20.38851	1.42988	17.00000	23.00000
FATH PROF.	0.02759	0.16397	0.00000	1.00000
FATH MANAGER	0.03908	0.19401	0.00000	1.00000
FATH SALES	0.00690	0.08285	0.00000	1.00000
FATH CLERICAL	0.02759	0.16397	0.00000	1.00000
FATH CRAFT	0.14023	0.34763	0.00000	1.00000
FATH OPERATIVE	0.18161	0.38597	0.00000	1.00000
FATH LABORER	0.07586	0.26508	0.00000	1.00000
FATH FARMER	0.01379	0.11677	0.00000	1.00000
FATH FARM LABOR	0.03678	0.18844	0.00000	1.00000
FATH SERVICE	0.06437	0.24569	0.00000	1.00000
FATH HH SERVICE	0.00000	0.00000	0.00000	0.00000
MOTH PROF.	0.05517	0.22858	0.00000	1.00000
MOTH MANAGER	0.02529	0.15718	0.00000	1.00000
MOTH SALES	0.01149	0.10672	0.00000	1.00000
MOTH CLERICAL	0.08966	0.28602	0.00000	1.00000
MOTH CRAFT	0.01609	0.12597	0.00000	1.00000
MOTH OPERATIVE	0.11954	0.32480	0.00000	1.00000
MOTH LABORER	0.00230	0.04795	0.00000	1.00000
MOTH FARMER	0.00000	0.00000	0.00000	0.00000
MOTH FARM LABOR	0.02759	0.16397	0.00000	1.00000
MOTH SERVICE	0.12414	0.33012	0.00000	1.00000
MOTH HH SERVICE	0.06667	0.24973	0.00000	1.00000
HOURLY EARNINGS	4.88298	2.07353	0.72171	14.00000
HOURS PER WEEK	41.31494	6.77006	30.00000	96.00000
1980 INCOME	6420.31604	5763.98012	0.00000	65000.00000

TABLE A-3
DESCRIPTIVE STATISTICS
FOR REGRESSION/PROBIT DATA
WHITE FEMALES, FULL SAMPLE (N=848)

VARIABLE	MEAN	STANDARD DEVIATION	MINIMUM VALUE	MAXIMUM VALUE
CONCENTRATOR	0.10849	0.31118	0.00000	1.00000
LIM. CONCENTRATOR	0.15566	0.36275	0.00000	1.00000
CONCENTRATOR/EXPL	0.09434	0.29247	0.00000	1.00000
EXPLORER	0.01061	0.10253	0.00000	1.00000
INCIDENTAL/PERSON	0.19104	0.39335	0.00000	1.00000
INC. TRANSCRIPT	0.36675	0.48220	0.00000	1.00000
AGRIC. SPECIALTY	0.01061	0.10253	0.00000	1.00000
T & I SPECIALTY	0.02005	0.14024	0.00000	1.00000
HOME EC SPECIALTY	0.00943	0.09673	0.00000	1.00000
OFFICE SPECIALTY	0.43160	0.49559	0.00000	1.00000
HISPANIC	0.00000	0.00000	0.00000	0.00000
BLACK	0.00000	0.00000	0.00000	0.00000
YEARS EDUCATION	12.57547	1.14228	12.00000	16.00000
SES	-0.26786	7.49928	-30.00000	23.00000
MONTHS TENURE	11.95154	12.73708	0.00000	104.00000
EXPERIENCE	25.10017	14.07293	0.00000	63.00000
NORTHEAST	0.20873	0.40664	0.00000	1.00000
SOUTH	0.30660	0.46136	0.00000	1.00000
WEST	0.17099	0.37672	0.00000	1.00000
AGRICULTURE	0.00590	0.07661	0.00000	1.00000
MINING	0.00354	0.05941	0.00000	1.00000
CONSTRUCTION	0.01533	0.12293	0.00000	1.00000
MANUFACTURING	0.19458	0.39611	0.00000	1.00000
TRANSPORTATION	0.02712	0.16254	0.00000	1.00000
TRADE	0.25708	0.43728	0.00000	1.00000
FINANCE	0.10731	0.30969	0.00000	1.00000
BSNS SERVICES	0.03774	0.19067	0.00000	1.00000
PERS SERVICES	0.04245	0.20174	0.00000	1.00000
ENTERTAINMENT	0.00354	0.05941	0.00000	1.00000
PROF. SERVICES	0.21698	0.41243	0.00000	1.00000
PUB. ADMIN.	0.03774	0.19067	0.00000	1.00000
PROFESSIONAL	0.06368	0.24432	0.00000	1.00000
MANAGERIAL	0.03892	0.19351	0.00000	1.00000
SALES	0.04717	0.21213	0.00000	1.00000
CLERICAL	0.43160	0.49559	0.00000	1.00000
CRAFT	0.01651	0.12750	0.00000	1.00000
OPERATIVE	0.14151	0.34875	0.00000	1.00000
LABORER	0.02005	0.14024	0.00000	1.00000
FARMER	0.00000	0.00000	0.00000	0.00000
FARM LABOR	0.00354	0.05941	0.00000	1.00000
SERVICE	0.18042	0.38477	0.00000	1.00000
HH SERVICE	0.00825	0.09053	0.00000	1.00000
UNION	0.16888	0.37490	0.00000	1.00000
ED ASPIRATIONS	14.08373	2.32055	0.00000	18.00000
MISSING ED ASP	0.00708	0.08387	0.00000	1.00000

TABLE A-3
DESCRIPTIVE STATISTICS
FOR REGRESSION/PROBIT DATA
WHITE FEMALES, FULL SAMPLE (N=848)
(CONT.)

FATHER EDUC.	11.53533	3.07148	0.00000	20.00000
MOTHER EDUC.	11.58454	2.40794	0.00000	20.00000
H.S. GPA	1.63579	1.33794	0.00000	3.96000
MISSING GPA	0.31604	0.46520	0.00000	1.00000
RURAL	0.27830	0.44843	0.00000	1.00000
AGE	20.48703	1.41499	17.00000	23.00000
FATH PROF.	0.09198	0.28917	0.00000	1.00000
FATH MANAGER	0.12736	0.33357	0.00000	1.00000
FATH SALES	0.04599	0.20959	0.00000	1.00000
FATH CLERICAL	0.04127	0.19904	0.00000	1.00000
FATH CRAFT	0.22052	0.41484	0.00000	1.00000
FATH OPERATIVE	0.13915	0.34631	0.00000	1.00000
FATH LABORER	0.04127	0.19904	0.00000	1.00000
FATH FARMER	0.04009	0.19630	0.00000	1.00000
FATH FARM LABOR	0.00825	0.09053	0.00000	1.00000
FATH SERVICE	0.02830	0.16593	0.00000	1.00000
FATH HH SERVICE	0.00000	0.00000	0.00000	0.00000
MOTH PROF.	0.05542	0.22894	0.00000	1.00000
MOTH MANAGER	0.02594	0.15906	0.00000	1.00000
MOTH SALES	0.02476	0.15550	0.00000	1.00000
MOTH CLERICAL	0.16745	0.37360	0.00000	1.00000
MOTH CRAFT	0.01887	0.13614	0.00000	1.00000
MOTH OPERATIVE	0.08373	0.27714	0.00000	1.00000
MOTH LABORER	0.00472	0.06856	0.00000	1.00000
MOTH FARMER	0.00118	0.03434	0.00000	1.00000
MOTH FARM LABOR	0.00236	0.04854	0.00000	1.00000
MOTH SERVICE	0.08844	0.28411	0.00000	1.00000
MOTH HH SERVICE	0.00825	0.09053	0.00000	1.00000
HOURLY EARNINGS	3.98623	1.30371	0.33333	10.55000
HOURS PER WEEK	39.28302	4.98973	30.00000	90.00000
1980 INCOME	5171.98665	3936.10925	0.00000	67500.00000

TABLE A-4
DESCRIPTIVE STATISTICS
FOR REGRESSION/PROBIT DATA
MINORITY FEMALES, FULL SAMPLE (N=438)

VARIABLE	MEAN	STANDARD DEVIATION	MINIMUM VALUE	MAXIMUM VALUE
CONCENTRATOR	0.05936	0.23657	0.00000	1.00000
LIM. CONCENTRATOR	0.14612	0.35363	0.00000	1.00000
CONCENTRATOR/EXPL	0.11416	0.31836	0.00000	1.00000
EXPLORER	0.01826	0.13406	0.00000	1.00000
INCIDENTAL/PERSON	0.14612	0.35363	0.00000	1.00000
INC. TRANSCRIPT	0.44977	0.49804	0.00000	1.00000
AGRIC. SPECIALTY	0.00457	0.06750	0.00000	1.00000
T & I SPECIALTY	0.02055	0.14203	0.00000	1.00000
HOME EC SPECIALTY	0.04110	0.19874	0.00000	1.00000
OFFICE SPECIALTY	0.31507	0.46507	0.00000	1.00000
HISPANIC	0.39954	0.49036	0.00000	1.00000
BLACK	0.60046	0.49036	0.00000	1.00000
YEARS EDUCATION	12.44749	0.91052	12.00000	16.00000
SES	-5.45205	8.42282	-32.00000	22.00000
MONTHS TENURE	11.24485	12.76219	0.00000	84.00000
EXPERIENCE	20.80619	14.08730	0.00000	63.69231
NORTHEAST	0.19178	0.39415	0.00000	1.00000
SOUTH	0.43836	0.49675	0.00000	1.00000
WEST	0.22603	0.41874	0.00000	1.00000
AGRICULTURE	0.00457	0.06750	0.00000	1.00000
MINING	0.00228	0.04778	0.00000	1.00000
CONSTRUCTION	0.00000	0.00000	0.00000	0.00000
MANUFACTURING	0.19406	0.39593	0.00000	1.00000
TRANSPORTATION	0.03653	0.18782	0.00000	1.00000
TRADE	0.20776	0.40617	0.00000	1.00000
FINANCE	0.11644	0.32112	0.00000	1.00000
BSNS SERVICES	0.03196	0.17610	0.00000	1.00000
PERS SERVICES	0.05479	0.22784	0.00000	1.00000
ENTERTAINMENT	0.01142	0.10635	0.00000	1.00000
PROF. SERVICES	0.21689	0.41260	0.00000	1.00000
PUB. ADMIN.	0.04795	0.21389	0.00000	1.00000
PROFESSIONAL	0.05479	0.22784	0.00000	1.00000
MANAGERIAL	0.02283	0.14954	0.00000	1.00000
SALES	0.02511	0.15665	0.00000	1.00000
CLERICAL	0.45205	0.49827	0.00000	1.00000
CRAFT	0.01142	0.10635	0.00000	1.00000
OPERATIVE	0.14612	0.35363	0.00000	1.00000
LABORER	0.02055	0.14203	0.00000	1.00000
FARMER	0.00228	0.04778	0.00000	1.00000
FARM LABOR	0.00685	0.08257	0.00000	1.00000
SERVICE	0.17352	0.37913	0.00000	1.00000
HH SERVICE	0.01370	0.11637	0.00000	1.00000
UNION	0.23324	0.42346	0.00000	1.00000
ED ASPIRATIONS	14.62100	2.08574	0.00000	18.00000
MISSING ED ASP	0.00228	0.04778	0.00000	1.00000

TABLE A-4
DESCRIPTIVE STATISTICS
FOR REGRESSION/PROBIT DATA
MINORITY FEMALES, FULL SAMPLE (N=438)
(CONT.)

FATHER EDUC.	10.09918	3.59076	0.00000	20.00000
MOTHER EDUC.	10.17598	3.15830	0.00000	18.00000
H.S. GPA	1.23694	1.20728	0.00000	3.86000
MISSING GPA	0.40411	0.49128	0.00000	1.00000
RURAL	0.12785	0.33431	0.00000	1.00000
AGE	20.47945	1.50157	17.00000	23.00000
FATH PROF.	0.03881	0.19337	0.00000	1.00000
FATH MANAGER	0.05708	0.23226	0.00000	1.00000
FATH SALES	0.01598	0.12555	0.00000	1.00000
FATH CLERICAL	0.03653	0.18782	0.00000	1.00000
FATH CRAFT	0.15297	0.36037	0.00000	1.00000
FATH OPERATIVE	0.14155	0.34899	0.00000	1.00000
FATH LABORER	0.05708	0.23226	0.00000	1.00000
FATH FARMER	0.00457	0.06750	0.00000	1.00000
FATH FARM LABOR	0.03425	0.18207	0.00000	1.00000
FATH SERVICE	0.07991	0.27146	0.00000	1.00000
FATH HH SERVICE	0.00000	0.00000	0.00000	0.00000
MOTH PROF.	0.04566	0.20899	0.00000	1.00000
MOTH MANAGER	0.00913	0.09524	0.00000	1.00000
MOTH SALES	0.01598	0.12555	0.00000	1.00000
MOTH CLERICAL	0.08676	0.28180	0.00000	1.00000
MOTH CRAFT	0.01142	0.10635	0.00000	1.00000
MOTH OPERATIVE	0.13470	0.34180	0.00000	1.00000
MOTH LABORER	0.00457	0.06750	0.00000	1.00000
MOTH FARMER	0.00000	0.00000	0.00000	0.00000
MOTH FARM LABOR	0.00913	0.09524	0.00000	1.00000
MOTH SERVICE	0.17123	0.37714	0.00000	1.00000
MOTH HH SERVICE	0.07078	0.25674	0.00000	1.00000
HOURLY EARNINGS	3.85314	1.48725	0.41176	12.24419
HOURS PER WEEK	39.57078	5.14399	30.00000	85.00000
1980 INCOME	4512.29736	4411.93798	0.00000	55000.00000

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